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Canadian Issues
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Special thanks are due to all of the participants in The Association for Canadian Studies' 1978 national conference. This volume of papers from that meeting reflects the quality of the discussion and the interest of the participants.

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Preface

This issue of the Association's publication, *Canadian Issues*, is devoted to the papers presented at our 1978 annual conference, held at The University of Manitoba. The theme of the conference, "The Canadian North: Frontier or Homeland", is, obviously, a direct reflection of the importance that we attached to the work done by Mr. Justice Berger and his colleagues on the Commission on the impact of the pipeline.

The Association for Canadian Studies owes a debt of gratitude to the Department of Education of the Province of Manitoba for the financial help and encouragement given us for this conference. On behalf of all of those present at our meeting, and on behalf of those who find this publication of the conference papers of value, we thank the Government of that Province.

The editorial work on this issue has been done by Professor Paul Koroscil, Geography Department, Simon Fraser University. Paul is the immediate past-president of the Association, and he has contributed in an exemplary way to the development of the ACS over the years. Thanks are also due to Stanley McMullin, who has handled the Managing Editor's chores for this volume. Stanley, as the founding president of the ACS, also continues to provide outstanding support to his Canadian studies colleagues from coast to coast.

James E. Page
President
The Association for Canadian Studies

Introduction: The Canadian Northland

Paul M. Koroscil

A decade ago, J. Wreford Watson described the Canadian "North" as:

> ...strong in its wealth of minerals and fuels: and at the same time free, free in the immensities of its horizons, free in the emptiness of its landscape, free in all the potential that is there to be developed: free in the history that geography is yet to make.[1]

Until recently, the above quotation epitomized how many Canadians felt about past, be in control or will the native people be in control of this development? If it of wealth for potential economic development and that, if this development occurs, it will be in the national interest of the country. Furthermore, the statement also implies freedom of development, but it does not provide an indication about who will control this development. Will the southerner, as in the past, be in control or will the native people be in control of this development? If it is the former case, then the decision-making base for explaining this development philosophy will emulate from the populous metropolitan centres.[2]

The decision-makers realize that, if their cities are to thrive, the resources of the northern hinterland must be tapped to "fuel" their urban industrial base. In the past, the major developmental question that they have had to consider was accessibility to the resource. However, today, the critical question faced by metropolitan decision-makers relates to the developmental consequences of accessibility on the northern landscape and the inhabitants, the non-native and native people. Should the consequences be assessed prior to the development or should they be evaluated after the fact? Recently, this latter question has caused a great deal of concern among "northerners" over the urgent need by the metropolitan centres to exploit northern oil and gas. Despite the anxiousness by metropolitan leaders to make a decision to build pipelines to transport oil and gas, northerners argue that prior economic, social, and environmental impact studies should take place before any decision is reached, because they do not wish to suffer the same negative effects created by the exploitation of northern staples in the past.

Furthermore, the issue has become even more complicated by the fact that the native people have realized the future consequences of resource development, and they have effectively organized themselves to raise the issue of land claims. Their call for a settlement, before resource exploitation and pipeline development takes place in the Canadian "North", "has been one of the most important hinterland responses to metropolitan dominance in recent

years". The metropolitan leaders realized in the 1970s that, in order for them to make a decision on some of the most crucial issues in the north, they would have to at least listen to the voices of the northerners. Julie Cruikshank appropriately summarizes this situation by stating:

> The seventies will be remembered by northerners as the Age of Inquiries. A series of task forces, standing committees, hearing and pipeline inquiries have travelled to northern communities to discover the 'real north' and in their own ways they have gone some distance toward showing that the north has not just one or two but many faces. They have also given northerners a forum for developing and articulating some of their own values, plans and hopes for the future.[3]

"The Mackenzie Valley Pipeline Inquiry, headed by Justice Thomas Berger, has undoubtedly been the most serious inquiry, the greatest single attempt to give a human face to the north."[4] After considering the report, the decision-makers recommended the construction of a pipeline that would parallel the Alaska Highway. Undoubtedly, this decision will have a major effect on the social and economic growth of the Yukon Territory. A good deal of discussion on this topic arose at the Annual Conference of The Association for Canadian Studies, co-sponsored by the Department of Education, Province of Manitoba, at the University of Manitoba, in May of 1978. The majority of the following papers reflect this topic and other aspects of the conference theme, "The Canadian North: Frontier or Homeland".

To set the stage for understanding the growth of the Yukon Territory to the present day, Frank Duerden examines "The Development of the Non-Native Settlement Pattern". He argues that three inseparable factors, physical, economic and technological, have influenced the development and distribution of Yukon settlement. Apart from topographic barriers and climatic vicissitude, initial penetration of the Yukon Basin was discouraged by its very distance from the more densely populated areas of North America. However, once man overcame distance and the surrounding barriers, the Yukon Basin offered little resistance, as it possessed numerous interconnected valleys, with relatively low elevation, that provided hospitable settlement sites and numerous navigable rivers that provided easy access to all parts of the basin. Within the valley framework, settlement development was dictated by the economic factor.

Duerden discusses the economic factor on two levels. On the national scale it was the economic attractiveness of the region, relative to other regions, as perceived by potential migrants, that was responsible for migration into the Territory. On a regional scale, the proliferation of settlement accompanied the discovery and attempted exploitation of seemingly economically viable minerals, the locations of the mineral deposit dictating the direction of settlement proliferation.

Technology is the final factor which has influenced the location of settlement. Changes in mining technology and, particularly, transport technology have resulted in the most visible modifications in the Yukon settlement pattern. It is this latter factor that Colin Crampton expands upon in his paper, entitled "Selected Examples of Construction Associated with Transportation in Northern Landscapes". He describes the construction of roads, bridges, airstrips and pipelines in the Discontinuous and Continuous Permafrost Zones of

the Canadian North. Two examples which are applied to the Yukon are highway construction and bridge construction. He argues that it is impossible to avoid some damage to the variety of northern landscapes during construction activity, particularly in the Discontinuous Permafrost Zone; however, the careful monitoring of procedures can contain the amount of disruption.

The value of assessments prior to decisions being made on northern development is of paramount importance not only to the effects on the environment but also on the northern people. In the third paper, "The Assessment of Industrial Impact on the Northern Frontier", E.R. Weick comments on previous conventional methodology of social impact assessments. He notes that most of these studies have suffered from error and misconceptions. The one impact assessment that has been undertaken in the north, the Mackenzie Valley Pipeline Inquiry, has gone beyond conventional methodology and it has set new standards not only for that region but also for the country as a whole.

Issues of social and cultural identity have recently received attention in federal policy decisions about the Northwest Territories; however, this has not been true for the Yukon Territory, presently scheduled for pipeline development. The Mackenzie Valley Pipeline Inquiry clearly defined such issues in the N.W.T. and through its efforts this area has become identified as the 'true North' in much of the Canadian consciousness. By contrast, the Alaska Highway Pipeline Inquiry was little more than a rationalization for administrators already committed to large-scale development in the Yukon Territory. Considerable testimony from every community in the Yukon was given in good faith at that Inquiry. Yet that testimony shows the beginnings of a mythography which defines a cultural context strikingly different from the Northwest Territories, but equally viable. Julie Cruikshank in her paper, "Myths and Futures in the Yukon Territory: The Inquiry as a Social Dragnet", attempts to articulate some of those perceptions and the social, historical and environmental realities that they reflect.

Before an Alaska Highway pipeline can be built, the decision-makers in Ottawa must solve a critical issue–native land claims. In the final paper, John Steeves explores the issue of "Aboriginal Politics in the Yukon Territory". He traces the history of land-claim politics and the rising political consciousness of Yukon natives today.

References:

[1]J. Wreford Watson, *Canada: Its Problems and Prospects* (Don Mills, Ontario: Longmans, 1968), p. 253.

[2]See Paul M. Koroscil, "The Innis Tradition and the North" in W.H. Melody, P. Heyer and R.L. Salter (eds.), *Harold Adams Innis: Tradition, Context and Direction* (Toronto: McClelland and Stewart, forthcoming, 1979).

[3]Julie Cruikshank, *Myths and Futures in the Yukon Territory: The Inquiry as a Social Dragnet*.

[4]*Ibid.*

The Development of the Non-Native Settlement Pattern of the Yukon Territory

Frank Duerden

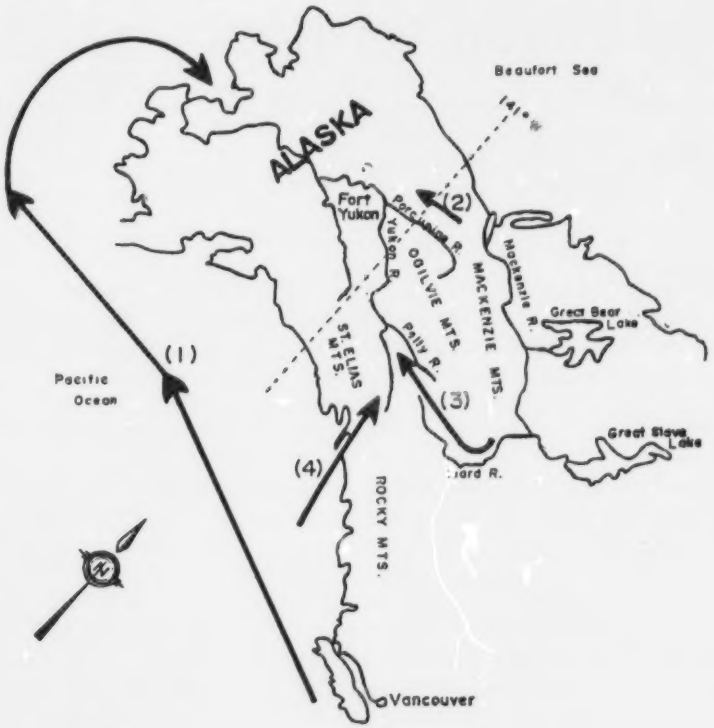
Although human occupance of the Yukon Territory has been the subject of several papers and articles in recent years, it is somewhat surprising that no geographer has addressed himself to a detailed analysis of the pattern and process of the peopling of the Yukon Basin by its non-indigenous population. The need for such analysis seems even more urgent in the light of the probable impact of proposed pipeline construction on the territory's contemporary settlement system.

Past works in the area have tended to focus in on specific areas or specific problems. Griffith Taylor was concerned with a study of only a limited part of the Territory, namely the Yukon Valley itself.[1] Ridge concentrated his study on three settlements, Whitehorse, Mayo Landing, and Dawson City.[2] Bone's work is, of necessity, rather sketchy and lacking in detailed fact,[3] and Koroscil limits his analysis to Whitehorse.[4] More recently Lotz and Bucksar have concerned themselves with the sociological ramifications of Yukon development, and although the former has examined the pattern of settlement development within the Territory, his analysis was somewhat superficial and lacking in historical detail.[5] This paper attempts to remedy the information deficiency, examining the motives for the peopling of the Yukon Basin and the changing distribution of settlement and population within the basin over time.

The first requirement for the proliferation of settlement in any given region is in-migration. On initial examination the relief and climate of the Central Yukon would appear to deter such migration. Essentially, the Yukon Basin consists of a series of steep-sided plateaus, with an average elevation in excess of 3,000 feet, bounded on three sides by mountain ranges, and drained solely by the Yukon River and its tributaries (Fig. I). To the north, the basin is bounded by the Ogilvie Mountains, to the east it is bounded by the Mackenzie Mountains, and in the south and south-west the interior plateaus terminate against the St. Elias Mountains. These three ranges present formidable barriers to the penetration of the Yukon Basin. In human terms, the climate of the Yukon Basin is adverse. The January mean minimum temperature in valley locations varies from -10°F at Carcross in the south to -28°F at Dawson City in the northern part of the presently inhabited area.

Apart from topographic barriers and climatic vicissitude, penetration of the Yukon Basin in the past was discouraged by its very distance from more densely populated areas of North America. Whitehorse, in the southern part of the study area, is 920 miles from Vancouver and 1,000 air miles from Edmonton. Further, the

Figure I
The Situation of the Yukon Basin and Major Pre-Gold Rush Approaches



KEY

(1) Pacific Coast – Bering Sea Route
(2) Bell's Route 1842-1847
(3) Campbell's Route 1842-1847
(4) Pacific Coast – Chilcoot Pass Route C. 1878

Table 1
Population of the Yukon Territory for Selected Years

Year	Total
1901	27,219
1911	8,512
1921	4,157
1931	4,230
1941	4,914
1951	9,096
1956	12,190
1961	14,628
1966	14,382
1971	18,385

low-level route into the Territory is from the west, from the Bering Sea via the Yukon River, the mouth of which is frozen over some five months of the year (Fig. I). The relief of the Yukon Basin, however, is such that once man has overcome distance and penetrated the surrounding barriers, he has a relatively high degree of freedom of movement. Numerous large inter-connected valleys contain navigable rivers and provide access to almost every part of the basin (Fig. II).

Initially, motive for movement into the Yukon Basin was the search for fur-bearing animals – and penetration was from the east, a logical extension of Hudson's Bay interests from the Mackenzie Basin. In 1842, Robert Campbell entered the Yukon Basin, crossing the Mackenzie Mountains from the headwaters of the Pelly, and descending the latter river to its confluence with the Lewes (Yukon), where he established Fort Selkirk in 1847.[6] Further north, John Bell had entered the Yukon system in 1842 from the Mackenzie by traversing the Peel watershed to the headwaters of the Porcupine and thence down this river to its junction with the Yukon, where in 1847 A.H. Murray founded Fort Yukon.

It was not until 1850, when Campbell sailed from Fort Selkirk to Fort Yukon, that it was realized that both forts lay on the same river. This discovery resulted in the abandonment of the Pelly-Laird route in favour of the less arduous Peel-Porcupine route to the Mackenzie basin; the section of the Yukon River between Fort Selkirk and Fort Yukon was used to transport the products of trade to the start of the new route.[7]

Fur trading did not prove to be lucrative enough to further full exploration of the Territory, and there were many set-backs to the development of the trade. In 1852, Indians sacked Fort Selkirk; Hudson's Bay posts consistently ran at a loss,[8] whilst in 1869 Fort Yukon was found to be in American territory and its operations were transferred to Rampart House on the Porcupine.[9] The acquisition of Alaska by the U.S.A. appeared to be further detrimental to the interests of the Hudson's Bay Company, insomuch as it now faced competition on the Yukon from the Alaska Commercial Company. In the face of the competition, the Hudson's Bay Company started to consolidate its commercial interests on the Mackenzie at the expense of interests in the Yukon Basin.[10]

A further motive for the penetration of the Yukon Basin prior to 1896 was the search for gold. The sporadic infiltration of the Central Yukon by prospectors, from about 1865 onwards, must be seen as a continuation of the northern movement of prospectors through the Cordillera, starting with the California gold rush of 1849. Prospectors came from the Pacific Coast, and in their northerly movement entered the Yukon Basin from the south, developing a new line of communication. In 1878, George Holt entered the Yukon Valley system by traversing the Coast Mountains via the Chilcoot Pass from the Pacific Ocean to the headwaters of the Yukon.[11] Holt's route had two major advantages. Firstly, the approach to the Canadian Yukon from the Pacific Coast was shortened by well over 2,000 miles. Secondly, the Chilcoot Route could be utilized earlier in the year than the route from the mouth of the Yukon, the upper river being free of ice and, consequently, navigable before the lower river.

Until 1896, small groups of prospectors entered the Territory, establishing settlements that were abandoned, as their inhabitants drifted from reported gold strike to reported gold strike. Prior to the Klondike Rush, only four settlements with any semblance of permanence emerged. These were Stewart, Ogilvie, and Fortymile, which acted primarily as mining service centers and trading posts, and

Fort Selkirk which was re-opened in response to increased traffic on the Yukon River.

The settlements, acting as mining service centers, displayed similar locational features. All were located at the junction of the Yukon and a tributary river, on which prospecting was taking place. Fortymile was the most important of the communities. It had evolved in 1887 at the junction of the Fortymile and Yukon Rivers, close to the Alaskan boundary, in response to the discovery of gold in the valleys of the Fortymile River and its tributary streams. With a population in excess of 500, an NWMP detachment, mission, and two trading companies, it was, by 1892, the largest settlement in the Yukon Basin.[12]

The Yukon Basin appears on the eve of the Klondike Rush as a sparsely populated and largely unexplored area, with non-native occupants confined to the Yukon River Valley. As late as 1892, Charles Hayes, of the United States Geological Survey, reported that:

> "Between the Yukon River and the St. Elias Mountains lies a large area...which has been geographically a blank. So far as can be learned it has never been penetrated by a white man, and the lakes, rivers and mountains which appear on many maps are a production of the geographer's imagination."[13]

Within the area of occupance there was further imbalance of population distribution. The vast majority of the Territory's immigrant population, estimated to be about 1,000 in 1893,[14] was located in the vicinity of the Fortymile gold strike, with the remainder living in scattered camps through the Yukon Valley.

The discovery of gold on Rabbit Creek, a tributary of the Klondike River, on August 16, 1896, provided the trigger action for migration into the Territory on an unprecedented scale, effectively driving a population salient into the virtually uninhabited Canadian Northland. The migration to the Klondike area was in two stages. Firstly, there was internal migration, as prospectors moved from camps within the Territory to the new strike. In 1896 Ogilvie was able to record that:

> "The reports from the Thron-Diuck are very encouraging, so much so that all other creeks are now practically abandoned, especially those on the Fortymile."[15]

Secondly, there was an influx of population from outside the Yukon Basin. This movement cannot be explained by just one positive factor, namely, gold discovery; there were other factors influencing the individual's appraisal of the region that made it seem both attractive and accessible. Mass circulation newspapers exaggerated the size of the gold discoveries and neglected to mention the physical adversity of the Yukon Basin. The news of the gold discovery hit an economically depressed industrial-urban world where, if anything, there was an abnormal demand for individual wealth, where supplies for an expedition were cheap, and where the possibility of finding gold was a viable alternative to unemployment. Finally, mechanized transport in the form of the railroad and the steamship could convey a person to the periphery of the Yukon Basin from any of the populated areas of North America in a matter of days.

As can be seen from a comparison of figures II and III, the Klondike Rush did not greatly widen the existing zones of human occupance in the study area. The Yukon Valley functioned as a major route to the gold-bearing areas, as it had for

the previous twenty years, and numerous small settlements appeared on the banks of the Yukon throughout its length, from its source to its junction with the Klondike. The main area of concentration of population and settlement was the gold-field area, comprising the valley of the Klondike and its tributaries, where the vast majority of the 30,000 persons arriving in the Yukon Basin in the period 1896-99 were located. The only significant immediate change in population distribution brought about by the Klondike Rush was the attraction of migrants to the Klondike, as opposed to the Fortymile.

Three types of settlement can be identified in the period 1896-1900:[16]

1. Service and Distribution Centres: Service and distribution centres had existed prior to the Klondike Rush in the form of Stewart, Ogilvie, and Fortymile. Dawson City, which became the centre for the Klondike mining area, displayed similar locational features to its predecessors. It was located at the junction of the major navigable river (the Yukon) and a non-navigable tributary (the Klondike), the valley of the latter giving easy access to the mining area.

2. Mining Settlements: These housed the labour force involved in mining and prospecting operations. Their location was dictated by proximity to gold-bearing gravels, and they lay in valleys of creeks tributary to the Klondike and Indian Rivers.

3. Settlements Serving Lines of Communication: Settlements emerged on the routeways through the territory, essentially to serve transients on these routes and maintain the lines of communication. The distribution of these settlements was partly dictated by the nature of the transport route itself. On the Yukon River route, Bennett emerged at the point where the tree line and lake coincided and boats could be built for the journey northwards; Canyon City and Whitehorse came into existence where navigation difficulties dictated a portage; the settlement of Laberge acted as a resting place, after the hazardous crossing of Lake Laberge. Initially, examination of a map of the Yukon Valley for the period 1900-1910, showing regular distribution of settlement, suggests that such settlement emerged due to the service needs of transients and the fueling necessities of steamboats. However, whilst the servicing of transients was undoubtedly a major motive for the emergency of many Yukon Valley settlements, it is to be borne in mind that hunting and trapping made a substantial contribution to the livelihood of these communities. Consequently, it is to be surmised that the spacing of settlements in the Yukon Valley may have been partly a function of the area required to maintain a viable hunting and trapping economy.

The "Klondike Rush" was short-lived. It reached its peak in the summer of 1898; by 1900 its force was spent.[17] With improved economic conditions in industrial-urban North America, exhaustion of the more accessible gold, the advent of large-scale, capital-intensive extractive methods, and realization of the hardships involved in living in the Territory, the population declined rapidly. The Territory's population, estimated to be 30,000 in 1899, had fallen to 8,512 by 1911 (Table 1).

In terms of human numbers, the Klondike Rush had been over-subscribed; the miners who were in the Territory prior to the discovery of the Klondike deposits staked the best ground before migrants from outside arrived. There were no alternative occupations for the surplus population.

> "The Klondike Rush could not reveal, as others could, the capacity of a region for carrying a large population a higher level of civilization."[18]

The Klondike Rush left a marked impression on the Yukon. Numerous settlements had been established in areas where none had existed before. With the introduction of a regular steamboat service on the Yukon River, the opening of the White Pass railway from Skagway to Whitehorse (1900), and the construction of the Whitehorse-Dawson winter road (1902), (Fig. IV), a regular north-south line of communication had been forged. Finally, the magnitude of the Klondike Rush had been such that exploration of the Territory had been furthered, whilst after the rush had terminated, the residue population was large enough to act as a reservoir for future exploration and development.

Paradoxically, the decrease in population was accompanied by proliferation of settlement outside the Klondike area. The reason for this proliferation lay in the search for economically viable minerals beyond the confines of the Yukon Valley and the Klondike gold fields. As production in the Klondike levelled out and became increasingly monopolized by large-scale organizations, prospectors, encouraged by the magnitude of the Klondike discovery, directed their attention to other parts of the Yukon Basin.

Whether a mineral claim was staked or worked depended upon human assessment of the economic viability of the ore involved. This assessment involved the consideration of numerous variables, the most important of which were transportation costs, the actual cost of working the ore, and world mineral prices. The most important single factor contributing to the development of mining in the period 1900-1912 was reduction in transportation costs. The construction of the White Pass railway had reduced the cost of transport from Whitehorse to Skagway from $1.00 per lb. in 1898 to 4 1/2 cents per lb. in 1901[19] and, although brought into existence by the Klondike development, it aided the whole region, substantially reducing the cost of transporting any mineral found within the Yukon Basin.

As the search for minerals widened through the Central Yukon, so numerous temporary prospectors' camps emerged, eventually being replaced by more permanent settlement, following the discovery of apparently economically viable minerals. Despite the spate of exploration in the period 1900-1910, when most of the major valleys of the study area were surveyed, mining only developed in four areas – the Mayo area (silver, lead), the Kluane area (gold), in the immediate vicinity of Whitehorse (copper) and on Windy Arm of Tagish Lake (Fig. IV).

The location of apparently economically viable mineral deposits dictated the direction of growth of lines of communication within the Yukon Basin. Transport routes were forged to connect the new mineral deposits to the main north-south line of communication. The Stewart River became the line of communication between the Mayo mining area and the Yukon Valley; the valleys of the Takhini and Dezadeash joined the Kluane area to the Yukon Valley, whilst the Whitehorse and Conrad areas lay within the Yukon Valley itself. The extension of communications was accompanied by the growth of attendant transient serving settlements,

and in the mining areas themselves service and distribution and extractive settlements emerged. Kluane acted as distribution centre for the Kluane mining area.[20] Mayo Landing and Gordon Landing served the same function for the Mayo area,[21] and Carcross, at the point where the White Pass railway crossed Tagish Lake, acted as the distribution centre for the Conrad Mines.[22]

The forces of dispersion were spent in a very few years. By 1910, proliferation of communications and settlements had virtually ceased, and over the next two decades the mining developments, which had followed the termination of the Klondike Rush, proved to be economically precarious. The Conrad mine closed, transportation proving to be a costly factor in development, despite proximity to rail-head.[23] In the Whitehorse area, geological problems rendered copper mining expensive, extraction eventually ceasing, with the collapse of copper prices at the end of the First World War.[24] By 1930, the Mayo area, the site of the most important post-Klondike mineral discoveries, was experiencing difficulties as world silver prices declined:

> ..."an ore that was profitable a year ago can no longer be considered an ore, the minimum content of silver necessary for economic operation has nearly doubled."[25]

It was increasingly evident that mining activity within the Yukon territory, characterized by high costs due to such factors as distance from markets, labour shortage, and high capital expense involved in working in areas of permafrost, could only survive under boom conditions where exceptional world prices offset the high cost of production.

Despite the low level of population in the period 1920-1940, there was no appreciable shrinkage in the number of settlements or abandonment of any major inhabited areas. As mining activity faltered, settlements moved towards a subsistence existence, trapping making a greater contribution to the economy of individual settlements. As long as the mines in the northern part of the study area remained open, the unwieldy communiations network which served them had to be maintained with its attendant road houses, steamer fueling stations, and dependent hunting and trapping-based river settlements.[26]

The stagnation of the period 1920-1940 seems almost paradoxical when conditions in this period are contrasted with those contemporaneous to the Klondike Rush. The territory was now mapped and explored; there was a transportation infra-structure, the cost of movement within the territory was relatively low. Settlements existed to provide accommodation and services; there was even a major world depression greater than that which had preceded the Klondike Rush, conceivably providing external conditions favourable to migration into the Territory.

The causes of stagnation were economic and human. The economic causes – distance from world markets and fluctuating world mineral prices – have already been outlined. In human terms, man was now fully acquainted with the difficulties of life in the Territory; the penetration of the Yukon Basin was no longer the pioneering trip of thirty years previously, with aspirations and hopes built upon lack of knowledge, false report, and rumour. The printed media, which once exaggerated the accessibility and wealth of the Yukon Territory, now told of the hardships faced by the vast majority of the gold-seekers on the Trail of '98 – people who had entered the Yukon in the winter of 1897 prior to the advent of the railroad, steamboat, or sizeable permanent settlement.

The second growth period in the Yukon dates from the end of the Second World War, and three factors can be seen as instrumental in the revival of the territory's economy: highway construction, renewed government interest in the Canadian North, and increased world demand for a variety of minerals.

Construction of the Alaska Highway system for Alaskan air bases heralded an era of road development. Within the study area, the highway runs from the British Columbia border to Whitehorse and, then, along the line of the former Kluane wagon road and Shakwak Valley to the Alaska border. In the post-war period, the Federal government financed a road construction programme; by 1955, highways paralleled and replaced the Yukon River and the Stewart River as routes to the mineral-bearing areas of the north. More recently, the highway system has been modified with the construction of a highway from Watson Lake on the Alaska Highway to Carmacks on the Whitehorse-Dawson road in order to serve the Anvil-Dynasty development and the associated new town of Faro. This link may well have future regional significance, insomuch as it represents the first true, albeit primitive, network development in an area with a transport system which up to the present time has been of the type traditionally associated with the early stages of economic development.[28]

Both highway development and government activity have been instrumental in influencing the final factor contributing to economic growth in the post-war period, namely, the increased mineral exploration. High world mineral prices, reflecting increased demand for a wide range of technologically applicable minerals such as copper, zinc and asbestos led to renewed prospecting and mining activity. The new highway system reduced transport costs and provided all-season, single-media transport to the mining areas, whilst government financial assistance created a climate favourable to the expansion of the mining industry.[29]

In the period 1945-1971, the settlement pattern in the study area changed radically. The initial observation to be made is that population increased from 4,914 in 1951 to 18,385 in 1971, but the number of settlements fell from 26 to 19 in the same period (Figs. VI & VIII). At the same time, there was no proliferation of settlement outside that part of the valley framework of the Yukon Basin peopled prior to 1910, namely the valleys or immediate tributaries of the Yukon, Stewart, Dezedeash, Takhini, and Shakwak, and one major area, the Klondike, was virtually abandoned (Fig. VIII). Table 2 underlines the obvious trend towards fewer, larger settlements.

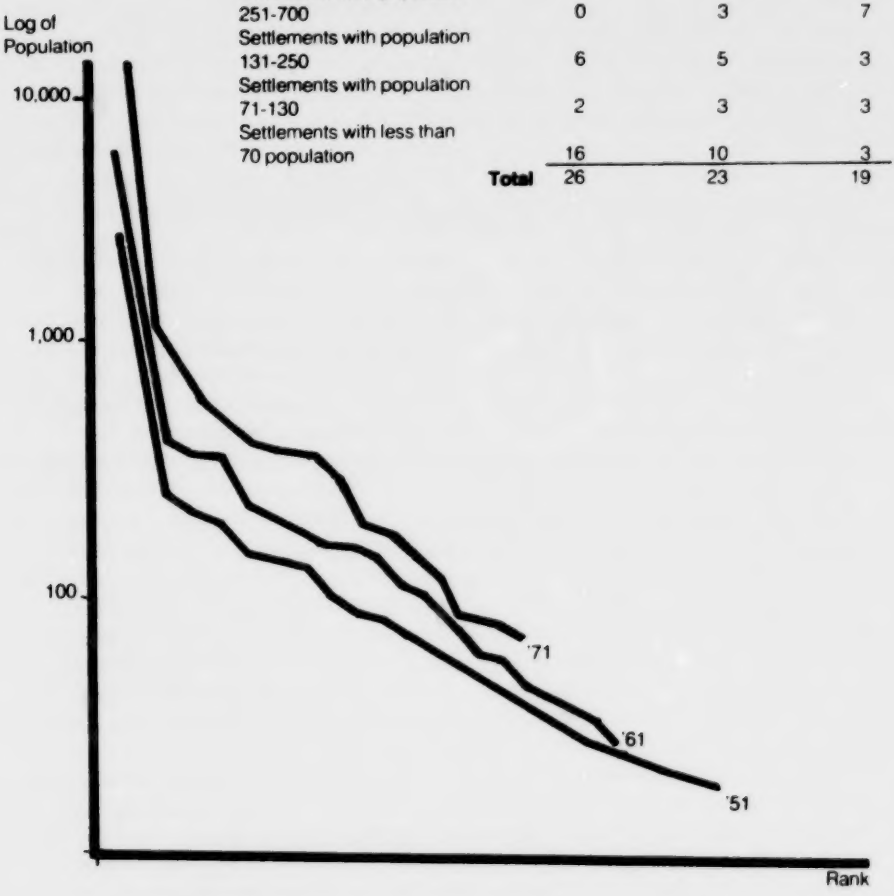
The decline in the number of settlements can be accounted for by two major factors: the abandonment of mining camps in the Klondike, as operating costs rose in the face of a fixed world gold price, and the ceasing of river traffic on the Yukon, following the construction of the Whitehorse-Dawson Highway. Although river settlements had a dual economy, namely, trapping and the servicing of river traffic, the closure of regular river transport led to their demise. Lotz commented on the social ramifications of highway development:

> "Before 1953 the river was alive with boats...a living thread down which travelled people, news, goods and gossip. The highway that can be traversed so quickly does not serve the same function."[30]

With the advent of the highway, the cumbersome transport routes which had required numerous service settlements were displaced. Those river settlements

Table 2
Changes in the Settlement System of the Yukon Territory, 1951-71

	1951	1961	1971
Settlements with population in excess of 700	2	2	3
Settlements with population 251-700	0	3	7
Settlements with population 131-250	6	5	3
Settlements with population 71-130	2	3	3
Settlements with less than 70 population	16	10	3
Total	26	23	19



which the Whitehorse-Dawson-Mayo road by-passed failed, and it is interesting to note that with their demise came a decline in the value of furs trapped in the Yukon,[31] possibly reflecting the contribution that these river settlements had made to the economy of the territory. With the change in transport media came an increase in the distance between settlements in the Yukon valley, from an average of 25 to an average of 75 miles.

The decrease in the number of settlements accompanied a shift in the balance of population distribution from the Dawson-Mayo axes in the north to the Alaska Highway in the south. Once more the failure of mining in the Klondike was a contributing factor, but further factors were the rapid growth of Whitehorse as the Territorial Capital after 1953, and the growth of settlements such as Watson Lake, Haines Junction and Beaver Creek on the Alaska Highway, as tourist services developed and native settlements by-passed by the new highway were depopulated.

The advent of the all-weather highway has influenced the location of extractive settlements. Prior to 1955, three types of settlement – communications serving, distribution centre and mining community – may have been required to serve a mining area, reflecting the cumbersome and seasonal transport links within the territory. After 1955, with single media transport, only one functional type, or, indeed, one settlement was required. Settlements involved in extraction could act as both service centre and mining community; reliable single media transport allows a community to be located away from the point of extraction, possibly allowing a compromise between a relatively hospitable settlement site and access to the mining area.

This new locational trend was seen in the development of the new towns of Clinton Creek and Faro. Both towns were created in the late 1960's, Clinton Creek serving an asbestos mine on a tributary of the Fortymile River, and Faro housing the labour force of the Anvil lead-zinc mine near the Ross River. Although it would have been cheaper to combine townsite and mine at one location in the case of Clinton Creek,[32] aesthetic considerations overrode short-term financial considerations and the town is located on the Fortymile River, some five miles from the mine site, whilst Faro is located about fifteen miles from the Anvil mine. One may surmise that the sociological and psychological benefits of this location for the settlement's population may, in the long run, outweigh any short-term financial saving that would have been made by location at the point of extraction.[33]

The Territory's service centres act as the nodes of the highway system, and, as such, their fortunes over recent years have been closely tied to the new lines of communication. Although the highway displaced the original "raison d'être" (break of media) of the communities, the high speed transport it provided strengthened their hold over their uplands. Displaced persons from the river settlements, which had collapsed with the closure of river traffic, now moved into these large centres. The result of these changes was that the decline of Dawson and Mayo was halted (at least temporarily) and Whitehorse, at the hub of the transportation system, strengthened its position as the Territory's primary service centre.

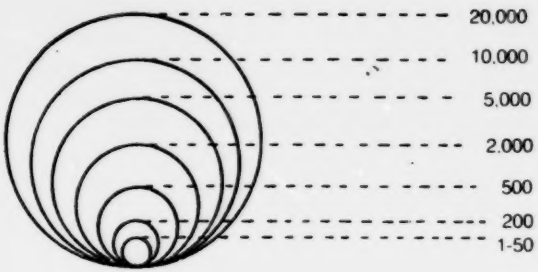
From the foregoing examination, three virtually inseparable factors influencing the development and distribution of Yukon settlement can be recognized.

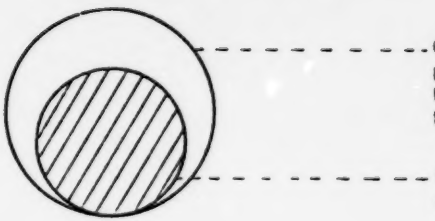
The first is the physical factor. Interconnected valleys with relatively low elevation provide the most hospitable settlement sites and easiest routeways in a

remote, rugged, and climatically adverse area. With the passage of time, accumulated geographical knowledge and technological advance have given man the capacity to settle in what he previously perceived to be marginally habitable areas, thus apparently diminishing the importance of physical controls. At the same time, however, improved transportation has enabled man to locate on fewer, more hospitable settlement sites without any corresponding reduction in the aerial extent of primary economic activity. Within the valley framework, man had a high degree of freedom of movement, and direction of settlement development within the framework was dictated by the second factor, namely that of economic incentive.

The role of the economic factor can be seen on two levels. On the national scale, it was the economic attractiveness of the region, relative to other regions as perceived by potential migrants that was responsible for migration into the territory. On a regional scale, the proliferation of settlement accompanied the discovery and attempted exploitation of seemingly economically viable minerals, the location of the mineral deposit dictating the direction of settlement proliferation. Much short-lived settlement resulted from failure to adequately consider such factors as transport costs, or relate costs incurred in extraction and transportation to world mineral prices. It is significant to note that the greatest proliferation of settlement took place in the decade following the discovery of gold on the Klondike, when man's assessment of the possible mineral potential was colou red by objective optimism, resulting from the discoveries in the period 1896-1898, and when much of the territory was unknown and the marginality of mining operations not fully appreciated.

The final factor influencing location of settlement is technology. Technological improvements have rendered mining operations less marginal and physical adversity more tolerable over time, changes in mining techniques and transportation influencing the actual site and distribution of settlement. Changes in transport technology have resulted in the most visible modifications in settlement pattern. As old lines of communication were displaced by new ones, the Chilcoot Trail by the railroad, the Yukon River by the highway, so the spatial distribution of settlements changed in response to the changing requirements and capabilities of different types of media. Transport improvement has given man an increasing degree of freedom in respect to settlement location and has allowed him to concentrate his activities in fewer settlements without any corresponding decrease in the area of the ecumene.




Outer circle represents the past population of the settlement if it has ever exceeded that illustrated for the current year
Current population of the settlement

Major Function

- Communication Servicing
- Mineral Extraction
- Trading Post
- Local Service Centre
- Territorial Service Centre

Routes

- River
- Trail
- Wagon Road/Winter Road
- Railway
- Highway

Absence of a population size circle indicates a settlement with an unknown population, in most instances probably much less than fifty

Figure II
1893

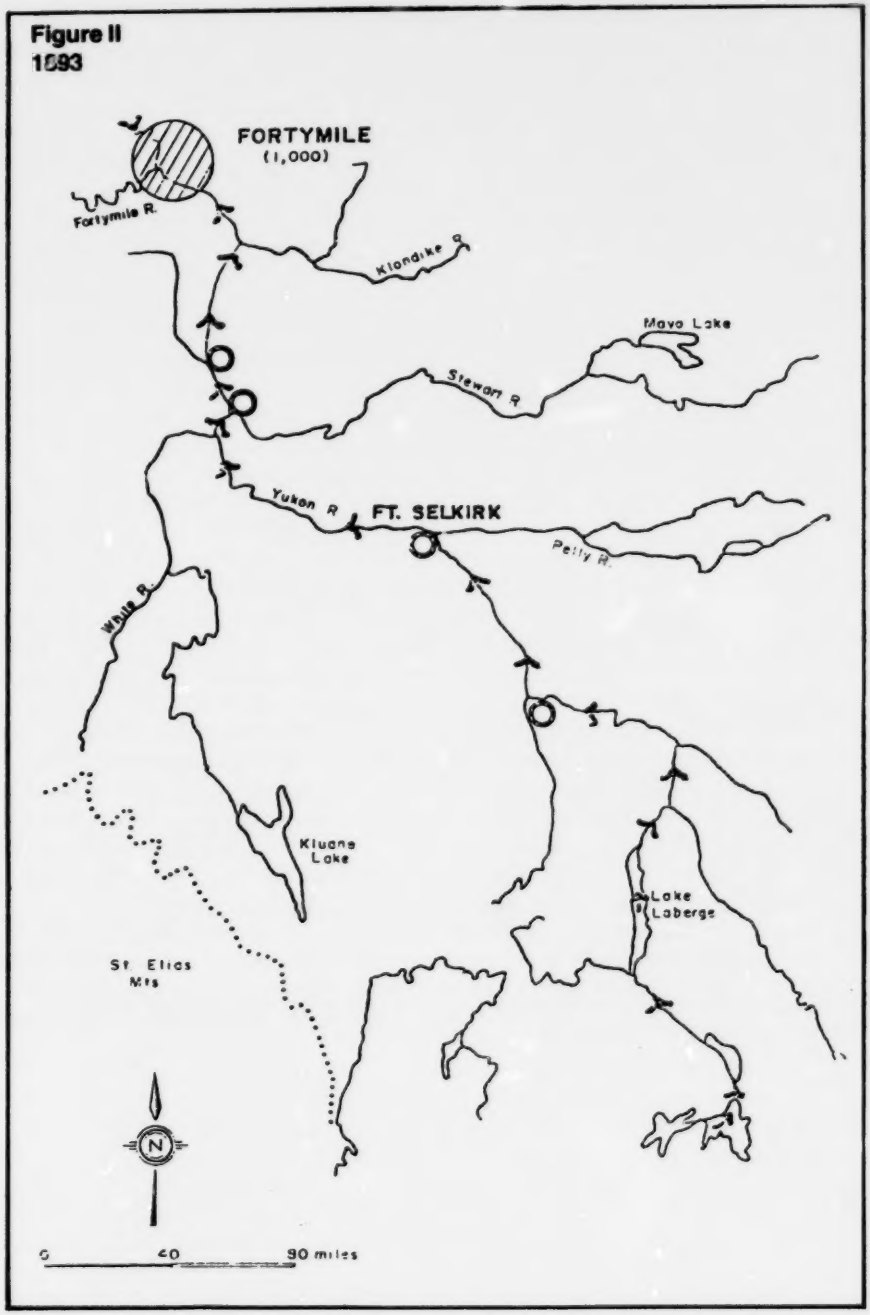


Figure III
1899

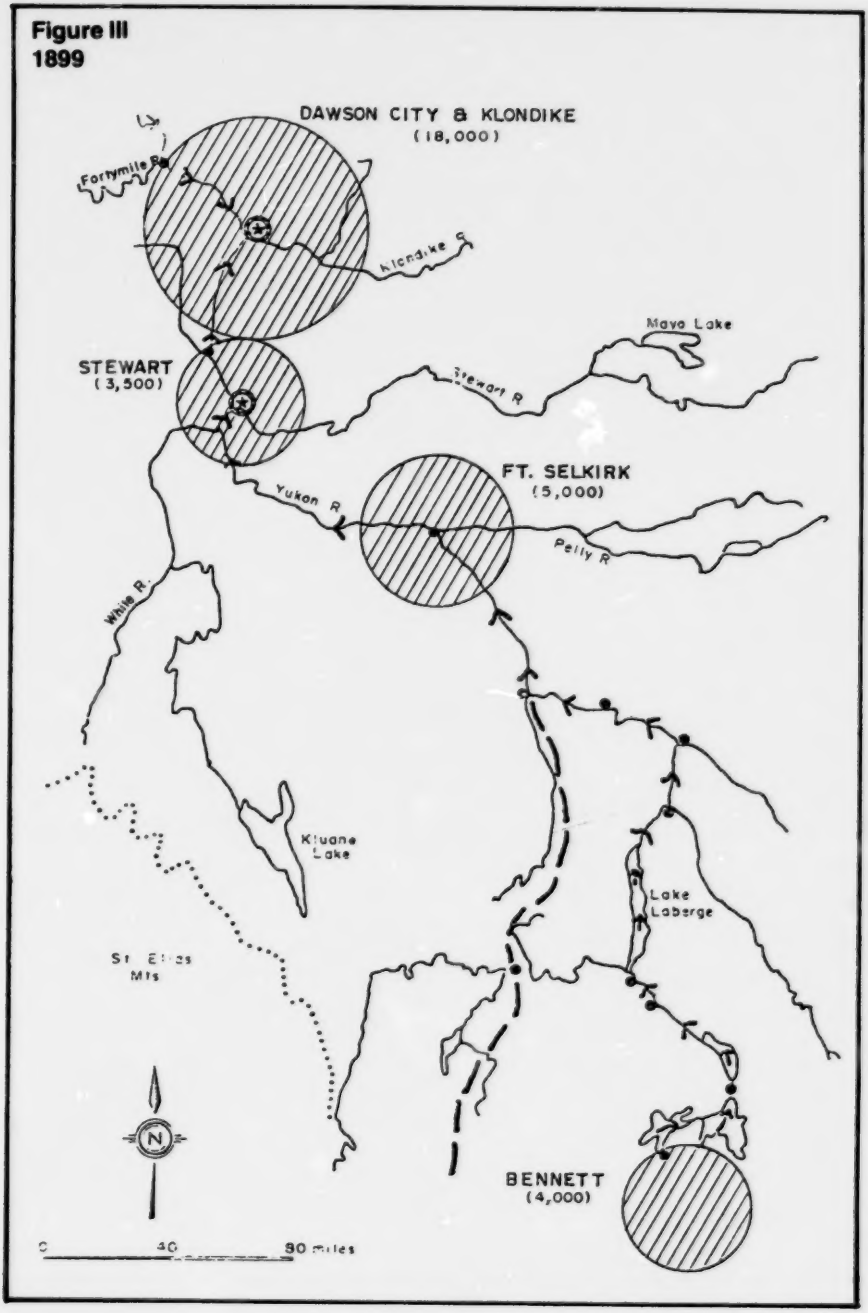


Figure IV
1911

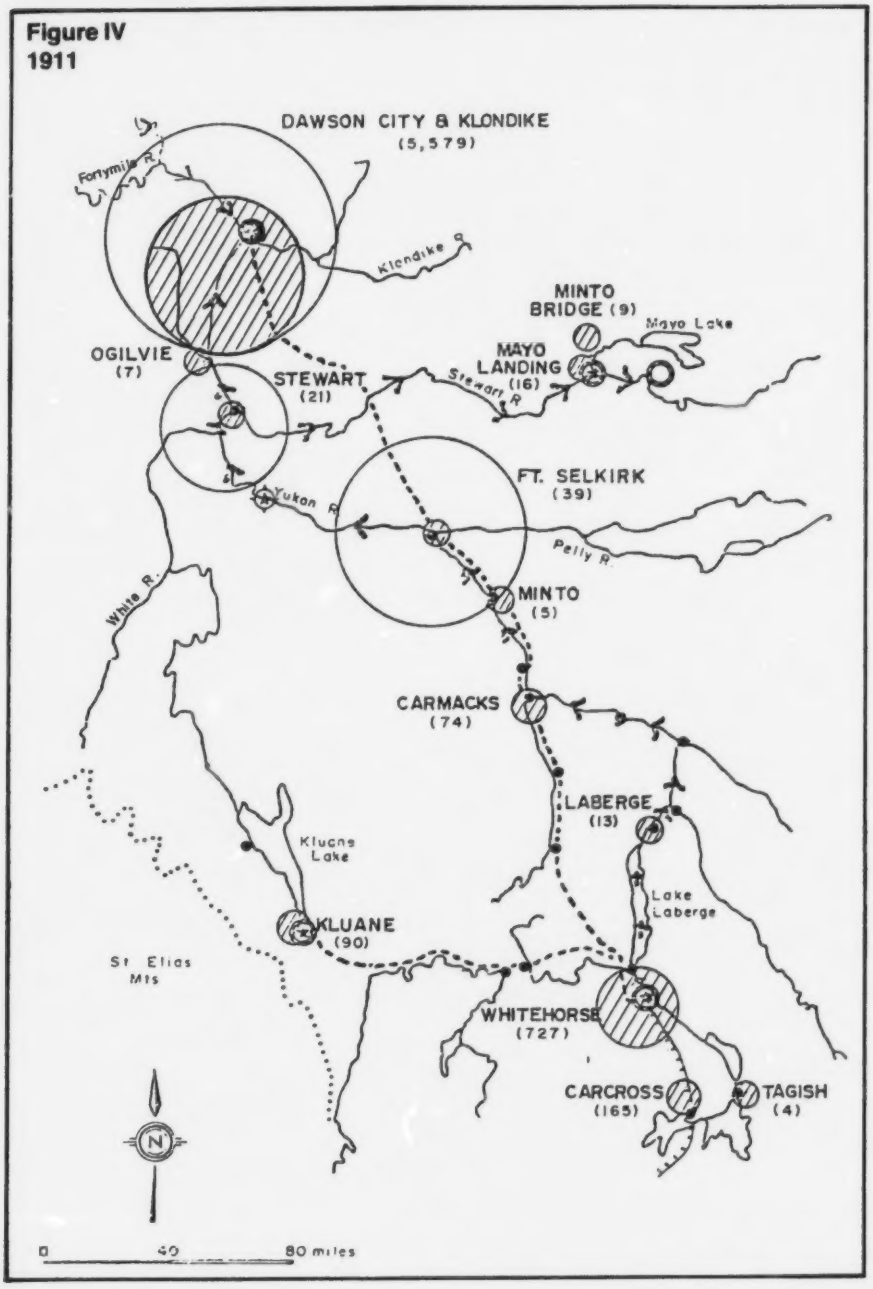
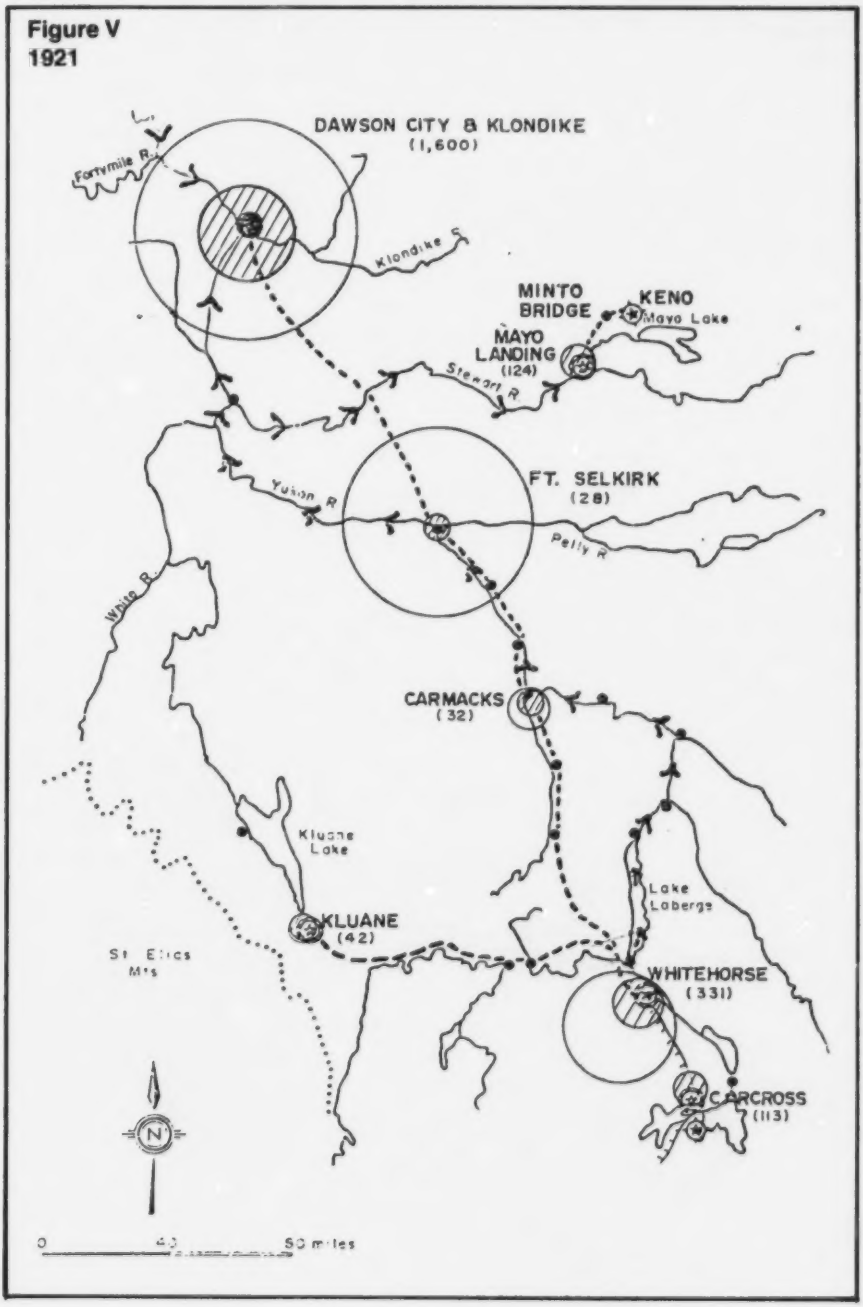


Figure V
1921



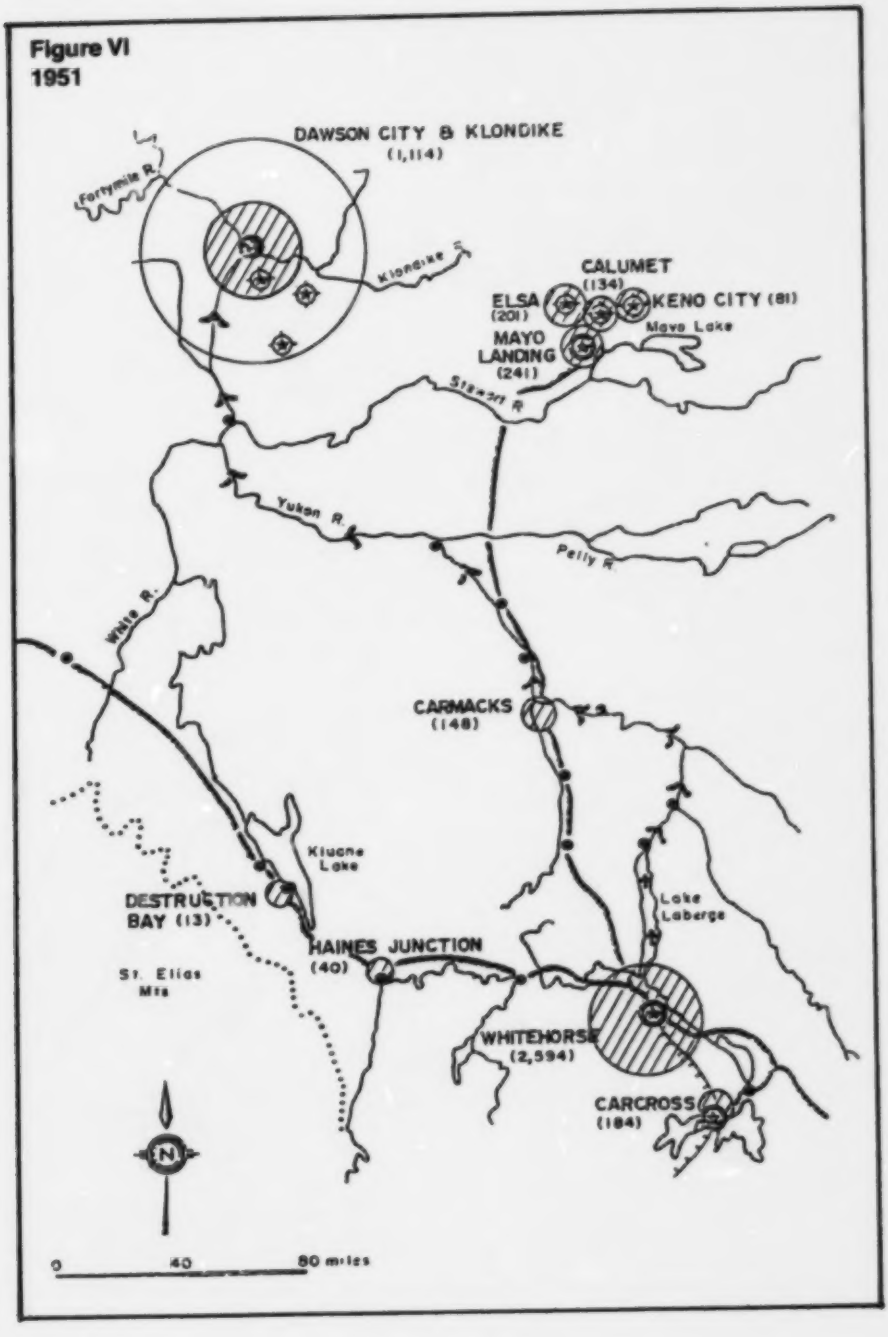


Figure VI
1951
DAWSON CITY & KLONDIKE
(1,114)
Fortymile R.
Klondike R.
CALUMET
(134)
ELSA
(201)
KENO CITY (81)
Mayo Lake
MAYO
LANDING
(241)
Stewart R.
Yukon R.
Pelly R.
White R.
CARMACKS
(148)
Kluane
Lake
DESTRUCTION
BAY (13)
HAINES JUNCTION
(40)
St. Elias
Mts
Lake
Laberge
WHITEHORSE
(2,594)
CARCROSS
(184)
N
0
40
80 miles

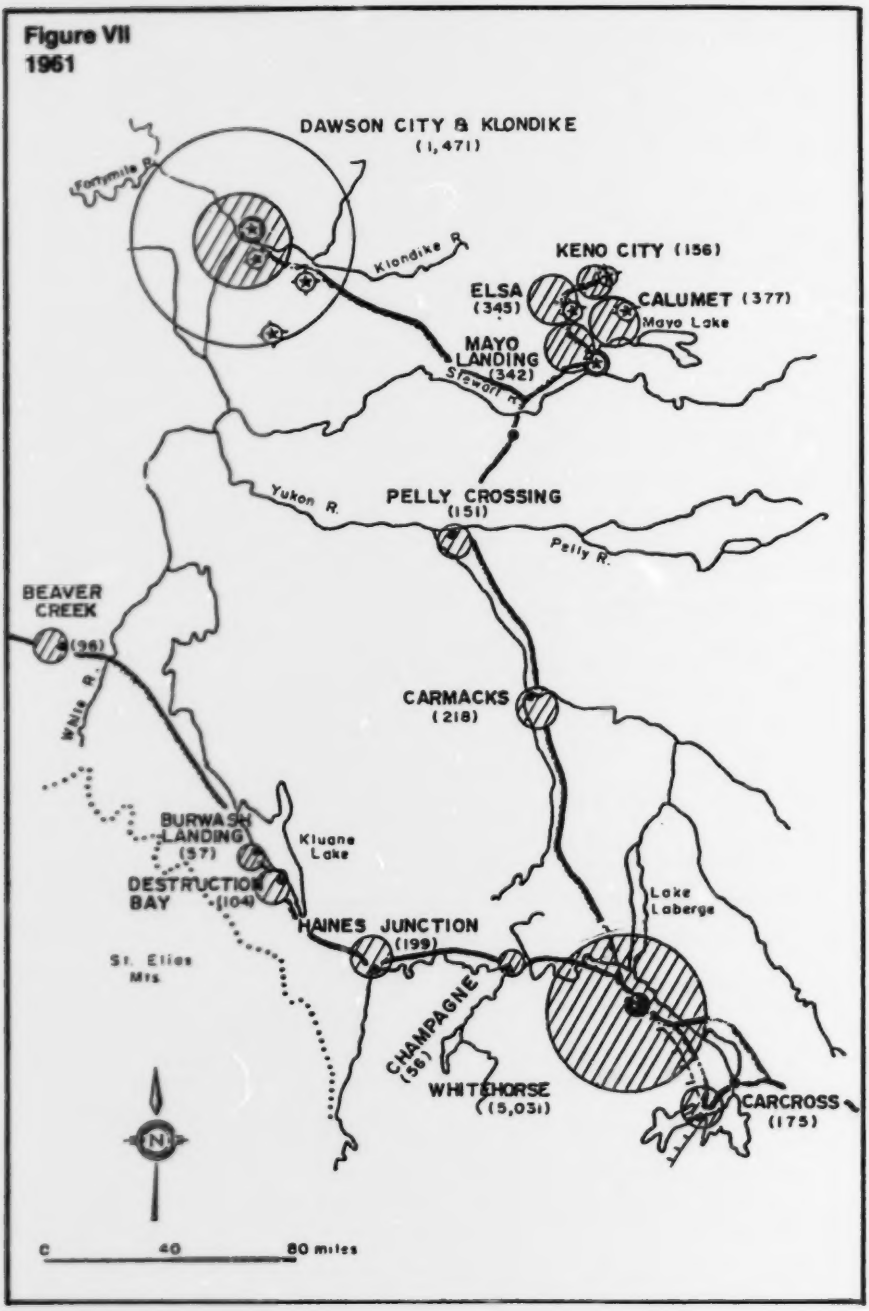
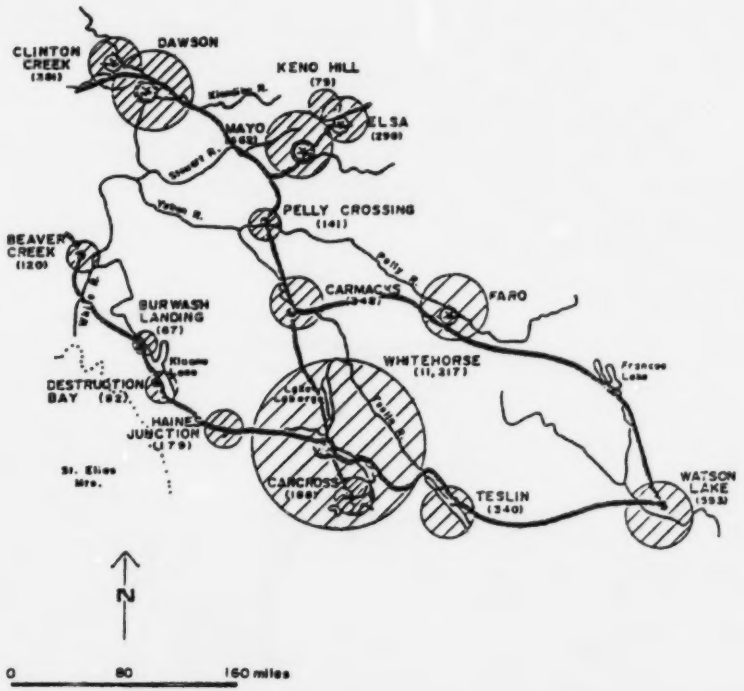


Figure VII
1961
DAWSON CITY & KLONDIKE
(1,471)
Fortymile R.
Klondike R.
KENO CITY (156)
ELSA
(345)
CALUMET (377)
Mayo Lake
MAYO
LANDING
(342)
Stewart R.
Yukon R.
PELLY CROSSING
(151)
Pelly R.
BEAVER
CREEK
(96)
White R.
CARMACKS
(218)
BURWASH
LANDING
(97)
Kluane
Lake
DESTRUCTION
BAY
(104)
HAINES JUNCTION
(199)
Lake
Laberge
St. Elias
Mts.
CHAMPAGNE
(56)
WHITEHORSE
(5,031)
CARCROSS
(175)
N
0
40
80 miles

Figure VIII
1971



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[33] The recently announced planned closure of Clinton Creek mine gives credence to the contention that no matter the attention paid to sociological and psychological factors in settlement development, no long-standing or stable community development can take place without a diversified or long-term economic base.

Selected Examples of Construction Associated With Transportation in Northern Landscapes

C.B. Crampton

Introduction

Permafrost is permanently frozen land at or below 0°C. Any water present occurs mostly as ice. The distribution of permafrost may be considered within two zones, the more northerly Continuous Permafrost Zone in which land is (virtually) frozen everywhere, and the Discontinous Permafrost Zone in which there is an irregular distribution of frozen and unfrozen land. Fig. 1 shows the occurrence of these two Zones in Canada.[1] The southern limit of permafrost coincides approximately with the mean annual air temperature of -1.1°C. The distribution of Zones is skewed to the southeast, occurring further south on the eastern side of the North American continent. Warm ocean currents from the equatorial regions sweep along the western margins of large continental regions in the northern hemisphere, bringing more temperate climates to British Columbia and Alaska than elsewhere at similar latitudes. Cold ocean currents from the Arctic sweep along the eastern margins of large continental masses, bringing cooler climates to Labrador and Newfoundland. The contrasting climates of the two coastlines causes the southeasterly skew of the Permafrost Zones.

The proximity of the oceans gives coastlines a maritime climate which is characterized by a relatively narrow temperature range from season to season, albeit within a narrower belt on the eastern side of the continent because of the southeast skewing of climatic zones. In contrast, continental interiors are characterized by a very great temperature range from season to season, yielding warm conditions during the short northern summer and very cool conditions during the long northern winter, and a greater penetration of a cooler climate to the south, compared with coastal regions.

A combination of the two described processes gives a very wide Discontinuous Permafrost Zone in the west, in the Yukon and western N.W.T., and a very narrow Discontinuous Permafrost Zone in the east, in northern Manitoba where the most southerly extension of permafrost occurs. Any characteristics of the Discontinuous Permafrost will, therefore, show their greatest extent around the Mackenzie River valley and the Yukon in the western Arctic, and any characteristics of Continuous Permafrost will show their greatest extent around western Hudson Bay.

It has been generally observed that permafrost in sandy soils is generally associated with little ice, while in silty, clayey or organic soils the ice content may be distributed in the substrate as scattered, visible ice crystals, or the ice

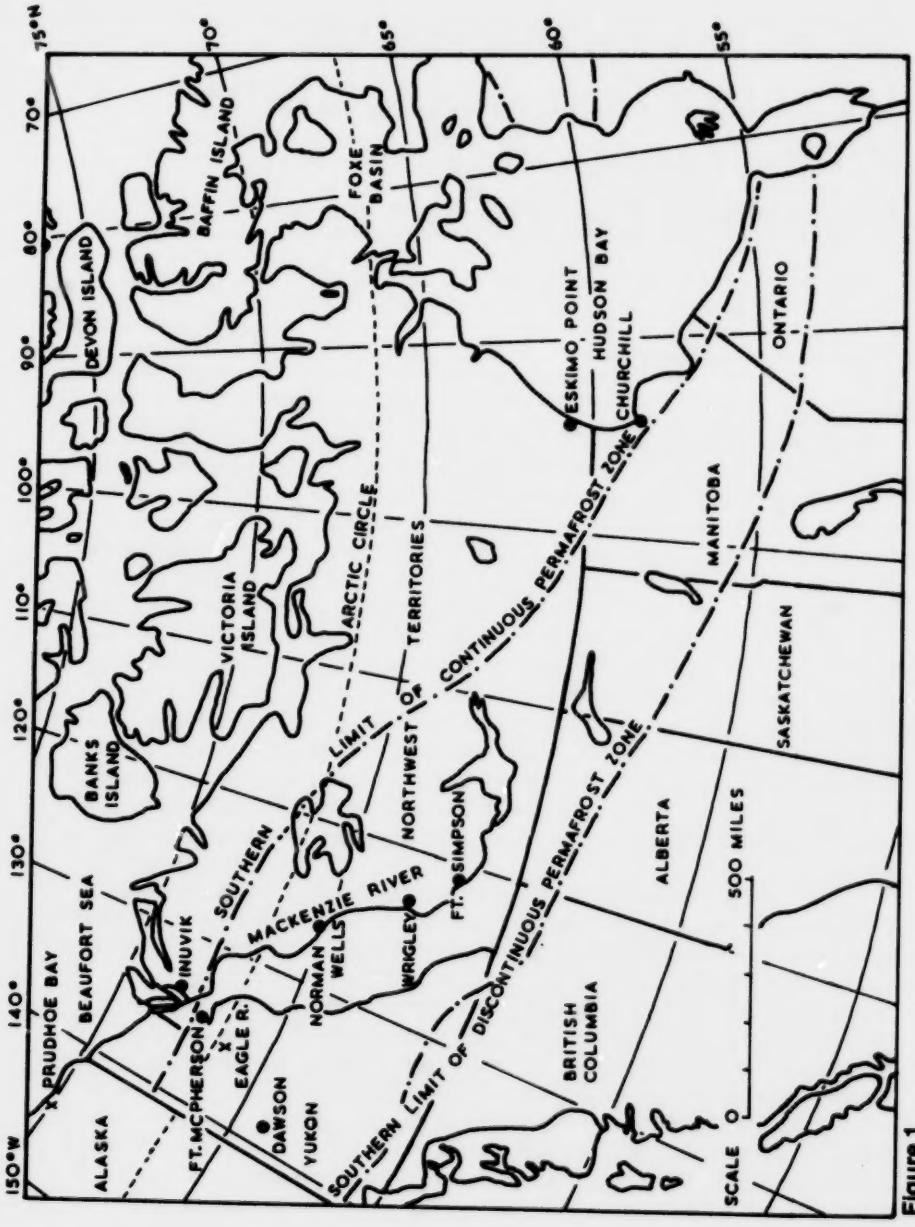

Figure 1.
Topography of the study-area, showing the distribution of permafrost zones.

may bond the substrate to give it a sheen. Increasing ice content is often associated with thin lenticles of ice in the substrate, which increase their thickness as the amount of ice increases, until there may be thick lenses of ice. Some low hills and peat landforms are cored with pure ice bodies. Locally, silts, clays and organic masses can contain up to 20 times their weight in water held as ice in the substrate. This amount of ice determines the properties of the substrate, such as its mechanical strength.

The seasonal freeze-thaw cycle is restricted to the so-called "active layer", the layer between the permafrost (permanently frozen) table and the surface vegetative and organic matter, in which ail soil biological activity takes place. The vegetation and organic matter restrict the transfer of heat between ground and air, and so preserve the permanently frozen substrate below the active layer from the short summer's warmth. If this insulation is pierced, the summer's warmth enters the substrate and melts any ice present. If large amounts of ice occur in the substrate, when melted, the greater quantity of water than soil will produce a slurry, which will flow down the most gentle of slopes, exposing more icy permafrost and continuing the erosion process year after year.

It is advisable to base any structure on a gravel berm since coarse-textured material will hold little ice and will impede the transfer of heat from the structure to the substrate.[2] It is unfortunate that good aggregate for berms is scarce in many parts of the Canadian North, even in some places where hard shield rocks crop out. Shales are extensive in strata of the western Arctic, such as in the Mackenzie River valley and in parts of the Yukon. Within the extreme climate of the North, shales weather into their major components of silt and clay, which are capable of holding large quantities of water as ice. In some parts of the North, especially in the west, only poor quality berm material is available. Locally, of particular importance in the southwest N.W.T. and southern Yukon, the melting of ice sheets during the last (Wisconsin) Glaciation left sandy deposits which are valuable as berm material.

Selected examples of construction associated with various transportation routes in the Canadian North are described, with a particular emphasis on the techniques used to avoid disrupting the northern landscapes

Warm Gasline Construction, northeast British Columbia, in the Discontinuous Permafrost Zone.

Laying a pipeline within a trench is the most economical way of transporting gas. Gas comes out of the ground warm and pumping it through the line keeps it warm. If substrate on either side of the gasline trench was continuously frozen, the gas would be refrigerated to avoid continuously disrupting the landscape along the line by melting any icy permafrost, and the production of subsidence over the trench and erosion down any slopes. However, refrigeration is sufficiently expensive that it would be discontinued as soon as possible, and would not be undertaken in sections of a line passing through frozen substrate in the Discontinuous Permafrost Zone. Warm gas thaws any local ice.

To attempt to ameliorate this disturbance of land in the Discontinuous Permafrost Zone by refrigerating the gas would create an ice bulb around the pipeline wherever it passed through areas of unfrozen ground, areas particularly extensive in the south of this Zone. In thawed substrate, a gas-filled pipe will float to the land surface, and so concrete saddle weights are placed on the

pipeline, calculated on the basis of soil analyses to give slight negative buoyancy; if melting of the substrate occurs, the pipeline should stay down in the trench. However, if the saddle weights are distinctly too heavy, the pipeline will sink beyond rescue, until it fractures. An ice bulb around a pipeline could produce such a major change in the line's buoyancy that it would cause sinking and fracturing of the line. Additionally, an ice bulb could cause profound changes in the underground hydrology, with unpredictable effects.

Refrigerated or warmed, a gasline must cause some disturbance of the landscape in the Discontinuous Permafrost Zone. In many ways, this Zone is the most sensitive to disturbance from construction activities in Canada's north, and the greatest care has to be exercised in the design of transport lines and in the supervision of construction teams. This sensitivity is reflected by the great variety of landscape types, or patterns produced by the interaction of geomorphology, soils and vegetation with different permafrost relationships to be seen in the Discontinuous Permafrost Zone, and in air photographs, not matched in the Continuous Permafrost Zone.

Difficulties encountered during the laying of a gasline include the choice of equipment for digging the trench. The conventional trenching machine moves rapidly across the land, but the teeth are quickly damaged wherever icy permafrost is contacted, and more expensive trenching procudures have to be adopted. Thus, in the Discontinuous Permafrost Zone more equipment than usual is required, and some of it is idle for part of the time. Pipe laying is always undertaken during winter when the ground is frozen, by regulation, so that disturbance of the land surface is minimized. Sub-zero temperatures necessitate the warming of pipes before welding. The winter days are short and any extensive construction activities have to be aided by artifical lighting. A temperature inversion (where colder air occurs close to the ground, the air temperatures rising with increasing altitude, up to a limiting elevation), normally encountered during the northern winter, tends to trap water vapour from men and machines, and fumes, close to their source, producing a local smog, further reducing the light intensity.

Northeastern British Columbia lies within the Discontinuous Permafrost Zone and, recently, several warm gas pipleines have been constructed through this Zone into neighbouring southwestern N.W.T. forested land, with freely drained mineral soils such as Orthic Eutric Brunisols,[3] often occurring on morainal or glacio-fluvial ridges and river banks or terraces, and normally supporting relatively good stands of white spruce and trembling aspen, with a rich herbaceous ground flora, are usually free of icy permafrost in the south of the Discontinuous Permafrost Zone. However, the incidence of ice in the substrate of these soils increases northwards through this Zone. Except in the north, routes across this type of landscape, cleared of forest for pipelines, are associated with few problems arising from the presence of permafrost.

Seasonally waterlogged, flat or gently undulating land is commonly associated with widespread, poorly drained Rego Gleysols, and a thick carpet of cushion mosses and sedges with stunted black spruce. More open areas are reticulate-patterned bogs, the so-called "fens". Ice is unlikely to be encountered in this wet landscape, except that, again, there is an increasing incidence of ice in the substrate northwards through the Discontinuous Permafrost Zone, particularly as it merges into the Continuous Permafrost Zone. Except where there is local ice, problems with pipeline construction are few.

Palsas or peat plateaus, discontinuous or continuous, respectively, low plateaus of organic matter sometimes cored with ice, are associated with labrador tea and caribou moss, and widely scattered, club-topped black spruce. Fen-like depressions are irregularly distributed across these lands. Risk of damage to the landscape where pipeline routes have been cleared of trees is minimized because of the virtual absence of slopes except at the edges of the plateaus. If the insulating vegetation is cut so as to expose the organic matter, some summer's warmth penetrates the organic matter and thaws the uppermost icy permafrost. This may create pools of water along the line, especially where there is more ice than organic matter within the plateaus. Sedges and willows spread out of the seasonally waterlogged depressions and act as pioneer species invading the lines two or three years after disturbance, normally re-establishing a vegetative cover and stabilizing the landscape.[4] If the plateau edge is opened to the summer's warmth, however, devastating inroads into the plateau can be caused by exposure of an ice core.

Gentle slopes with subparallel drainage runnels support soils and vegetation similar to that of the seasonally waterlogged lands. The natural drainage system contains flowing water chiefly during the spring thaw when great quantities of water are released by snowmelt. The angles of slope involved can be very small and normally water moves across the landscape very slowly. White spruce generally lines the larger, natural runnels down the slopes. In between these larger drainage runnels the relatively flat terrain of silty substrate may contain icy permafrost, thin in the south, thicker in the north of the Discontinuous Permafrost Zone, especially on north- and east-facing slopes with a cold aspect.[5]

Lines cut obliquely across these gentle slopes, intercepting much water during the spring thaw and divert it down the line. The volume of water flowing increases substantially downslope, to the extent that the flow may erode the line. This hazard is present on all slopes, whether there is icy permafrost present or not. When the vegetation is pierced, and especially when the organic layer is penetrated to expose any underlying ice-laden substrate to the summer's warmth, the amount of water available for runoff and erosion is greatly increased because of the amount of water held in frozen substrate. The resulting gully erosion, also reported in Alaska,[6] inhibits the re-establishment of a vegetative cover necessary for stabilizing the landscape. Carefully placed barriers on the line will help re-establish the natural drainage downslope, diverting water off the line and into the subparallel runnels. Sedges and cushion mosses then have the opportunity to spread off the surrounding land onto the line to aid the recovery of the vegetative layer necessary for protecting the icy permafrost.

Trenching operations disrupt the natural soil structure, and particularly cloddy, silty-clayey backfill occupies more volume than the original trench. This increase in volume, together with the displacement by a pipeline, ensures that a substantial berm is created across the trench after it has been filled. On well-drained forested sites or on seasonally waterloged flats this berm more or less balances subsequent settling into the trench. During any trenching operations across land having icy permafrost, as much as possible of the visible ice is removed from around the trench. However, finely disseminated ice or ice occurring as scattered granules in the substrate is not so visible and not so easily removed.

Because the soil structure has been disrupted, some summer warmth always enters the filled trench to thaw any unremoved ice. If the pipeline is warm, considerably more of any unremoved ice is thawed. Since so much water can be retained as ice in the substrate, this thawing can produce a substantial reduction in the volume of the backfill, causing subsidence and a trough to develop over the fill. The depth of this trough is exaggerated by the presence of backfill on either side of the trench line, since it is impossible to return all the soil removed from the trench to a position directly over the trench. The water is channeled along this trough across lineated slopes and can cause erosion. If there was no slope, there would be sheets of water across the line, but no erosion. Standing water may look bad, but erosion is the significant hazard in any landscape. As described before, barriers need to be placed on slopes across the trench line to divert the water into the natural drainage system before the artificial catchment collects sufficient water to cause severe erosion along the line. When redirected, the discharge of water into the selected natural drainage channels is considerably greater than the volume of water that flowed along the channels before site disturbance, which may cause channel deepening.[7]

Highway Construction, western N.W.T. and Yukon, in the Discontinuous Permafrost Zone.

Suitable gravelly aggregate for constructing berms for highways can be obtained locally in the southern part of the Discontinuous Permafrost Zone, from the better drained sites under high forest associated with river banks and terraces, outwash deposits, eskers or morainal ridges. Construction of the Mackenzie Highway to Fort Simpson has utilized many such sand and gravel deposits, yielding a stable road berm. Water percolates rapidly through coarse-textured materials, unlike silts and clays through which drainage is extremely slow. In frozen substrate the least amounts of water are held as ice in sands and gravels, from which most of the water appears to be expelled during freezing.[8] After construction of a gravel berm the permafrost rises into it during subsequent winters.[9] The sources of good road aggregate are scattered across the landscape, separated by extensive, intervening flats of seasonally waterlogged land usually developed upon finer-textured substrate and shales. Locally, the Mackenzie Highway has had to be routed across this wet land, and where local material has been used for the berm, the shale has quickly weathered into its principal components of silt and clay, leading to road subsidence which requires repeated maintainance.

Where ditch cuts have been made through the vegetative and organic layers to expose icy permafrost, the substrate has thawed during summer, producing slurrying, with consequent erosion of the banks and sometimes subsidence of the berm. As with gas pipelines, so with roads, the chief problem in the Discontinuous Permafrost Zone is the very local and irregular distribution of ice in the substrate, such that no standard construction technique can be used without causing some disturbance of the landscapes. The safest procedure in this Zone is the complete burial of the otherwise undisturbed landscape. The earliest major road built in the north was the Alaska Highway, and much of the now-accepted northern procedures was found by trial and error during its construction across the Discontinuous Permafrost Zone.[10] The

standard southern practice of ditching either side of the road berm produced substantial subsidence in many places. Another late World War Two highway in the north, the Canol Highway, was constructed to service the oil pipeline between Norman Wells in the central Mackenzie River valley and the Alaska Highway. At its eastern end, the road berm buried an otherwise untouched landscape, without cuts for ditches, and the road is still largely intact today, except at stream crossings.

Ditching is an increasingly hazardous practice as the Discontinuous Permafrost Zone merges into the Continuous Permafrost Zone. As the Mackenzie Highway was being constructed northwards from Fort Simpson, towards Wrigley, increasingly, each year's construction had to be repaired during the following year because of subsidence in the berm arising from the poor quality of the aggregate used, especially when exacerbated by cuts into icy permafrost. As the Dempster Highway was constructed northwards from Dawson City in the Yukon, and where good aggregate was available, there were few problems associated with subsidence.[11] As the road is pushed further north there is an increasing shortage of good quality aggregate, with a consequent deterioration of the road berm. Present construction into the Continuous Permafrost Zone is associated with more frequent subsidence of the berm, and the flow of cut-bank material across the road surface each spring. A dressing of crushed rock helps to reduce the amount of subsidence of cuts.[12]

If the hill slope angle is not too great, a road should be routed parallel to the drainage runnels so characteristic of northern slopes, so that as little spring runoff as possible is intercepted. If the road must be constructed transverse to the natural drainage, it is essential that drainage through culverts is adequate for the spring thaw.[13] Unfortunately, it is not always possible to determine which of many subparallel runnels carry significant quantities of water in spring. At the site of the Dempster Highway around the Mackenzie Delta the road berm was routed transverse to the slope drainage and the significant drainage runnels identified by washouts across the berm after the following spring thaw. Culverts were then installed and the berm repaired. The culverts should be embedded in gravel or crushed rock as they conduct heat into the berm and could inhibit the rise of the permafrost into the berm to stabilize it.

Bridge Construction across Eagle River, north Yukon, in the Zone Transitional Between the Discontinuous and Continuous Permafrost Zones*.

By agreement between the Department of Public Works and the Department of National Defence, the Canadian Military Engineers have undertaken construction of two bridges on the Dempster Highway, as it is pushed northeast through the Yukon, to link with Fort Macpherson and Inuvik in the N.W.T. The Military Engineers operated under similar constraints to those imposed upon a civilian contractor. The George A. Jeckell Bridge was constructed in the Discontinuous Permafrost Zone, where ice-free forested land abutted against either side of the Ogilivie River. The more northerly Eagle River Bridge, the subject of this study, also abutted against forested river banks, but in the zone transitional between the Discontinuous and Continuous Permafrost Zones, and so the bank substrate

* The Canadian Military Engineers, Chilliwack, British Columbia, offered all available information for this study.

contains ice. The bridge crosses the Eagle River at a gentle meander, which is migrating slowly northwards, and so the outer bend, the north bank, contains deeper permafrost, extending from the base of the active layer at about 2 ft. (0.6 m.), down to greater than 100 ft. (30 m.). Although the meander is immature and is migrating slowly, there has been insufficient time near the south bank for the permafrost to penetrate deeper. There is no permafrost below the actual river, which is commonly observed in the north. The Eagle River Bridge is 257 road miles (414 km.) north of Dawson City, and about 10 miles (16 km.) south of the Arctic Circle. The construction is a 300 ft. (91 m.) single span through-truss bridge.

Fifteen steel H-piles support the bridge at each abutment. At the south abutment, holes were drilled through the permafrost, the piles driven to refusal (about 100 ft.; 30 m.), and the holes backfilled with sand. At the north abutment, holes were drilled to about 35 ft. (11 m.), backfilled with sand, and the piles driven to refusal (little more than 35 ft.; 11 m.). A sand slurry was next introduced into the holes, filling any voids, and freezing the piles in place. The piles must be driven well below the active layer as the seasonal freeze-thaw cycle will cause frost heaves in this layer, which has been known to lift piles out of the ground.

Concrete pile caps were constructed around each group of piles, at a time when temperatures varied from above freezing to -22°C. Thus, the concrete was heated to 20°C when placed, and kept at this temperature with the help of curing shelters erected around each pile cap. The bridge bearings were then placed on the pile caps, on the assumption that the south abutment was the more stable. The steel piles were insulated form the concrete pile caps to stop the transfer of heat from the bridge into the permafrost. Also, 3 ft. (0.9 m.) of clearance was maintained between the base of the pile cap and the ground surface to ensure ventilation and further inhibit heat transfer. The mass of concrete was kept as little as possible because of the shortage of good aggregate in the area, and because large concrete masses are less able to withstand the extreme range of temperature characteristic of the area.

As with most northern rivers, spring break-up and flooding on the Eagle River are violent; therefore piling cribs filled with rock were placed around each pile cap to give it stability. The banks were armoured with about 1,000 tons (1,016 metric tons) of gabions (wire baskets filled with rock), 200 ft. (61 m.) upstream and 50 ft. (15 m.) downstream of the bridge. The tubular steel design of the bridge is able to withstand great changes of temperature, but it is weak in bending, and so the single span bridge has to be well supported during construction. Hence, the winter ice was used to support wooden falsework upon which the bridge was assembled, and the cranes for assembly work. This part of the project was critical as the bridge had to be self-supporting and the falsework removed by spring break-up, or the bridge would be swept away with the spring flood. Hence, it was important that all materials arrived according to schedule, and that spare parts were always available for breakdowns in equipment. The risks associated with this stage of construction precluded commercial tendering for the job. The steel members of the bridge were prepared on the banks, and placed in position by the cranes, the falsework removed, and the steel grid deck placed on the bridge, before spring ice break-up. The deck was welded during early summer, and the concrete approach slabs poured when special precautions did not need to be taken.

Shelter, food and morale of the workteams are most important factors in any venture of this nature, requiring careful pre-planning. Regular warm-up periods were essential for the workforce. Winter water supply had to be assured. The sewage was agitated, chlorinated and pumped out to a low-lying area, a common procedure in the north.

Airstrip Construction at Eskimo Point, southest N.W.T., in the Continuous Permafrost Zone.

Additionally, by agreement the Ministry of Transport and the Department of National Defence, the Canadian Military Engineers have also undertaken construction of airfields in northern Canada wherever conditions were distinctly unfavourable for commercial construction. The building of an airfield, taxiway, parking apron and access road linking with the hamlet of Eskimo Point on the shores of Hudson Bay will be used as an example. Eskimo Point has a population of some 700 residents, and is 160 miles (258 km.) north of Churchill, truly in the Continuous Permafrost Zone. To help maintain good relationships between the Military and the hamlet, wherever possible, some local people were employed, and after-hours maintenance and servicing was done on the hamlet's essential equipment. Stores and spare parts are not easily transported into an isolated settlement such as Eskimo Point, and planning had to start long before construction. With a summer twenty-four hour day, it is more efficient to keep equipment working all the time, but under this kind of pressure, any breakdowns cause havoc to schedules. Thus, it was essential that all supplies arrived before they were needed and that there were adequate spare parts. The organization had to allow for prompt emergency deliveries.

The local terrain undulates gently and is spotted with many lakes. Sandy and silty soils supporting a boulder-studded carpet of lichens, mosses and sedges alternates with rocky outcrops. Hummocky or tuddocky terrain occurs extensively, and is a very unstable surface that is easily disturbed.[14] Traversing the site there is an esker (a sub-ice river gravel left by the last glaciation, some 10,000 years ago). This esker is the primary source amongst few local sources of gravel, the gravel being generally poorly graded, and so this resource has to be carefully husbanded. The airstrip was oriented southeast and northwest with reference to the prevailing winds, but also to intersect the esker. The terrain was buried in an otherwise undisturbed state, using fill pushed or trucked from the esker.

Where the land surface undulated too much for an all-fill operation, cuts were made into the land surface, deep enough to allow immediate backfilling with the best gravel available, up to the level of the desired grade. If uncovered permafrost is silty or clayey and contains much ice, within a few days the area becomes a mire, into which heavy equipment can sink beyond rescue. Once the fill is in place the permafrost rises into it during the subsequent winter freeze-up, and stabilizes the ground.

Levelling for an airstrip can involve blasting rock outcrops and the hauling of the broken rock to intervening low-lying areas. Permafrost in hard rock is normally associated with little ice. Holes drilled for blasting are immediately charged with explosives, as any surface water enters and freezes at the level of the permafrost table, preventing charging of the hole to full depth. After blasting, particularly softer material such as shale, the rock must be removed as soon as

possible, since the permafrost tends to invade shale and freeze it, making clearing impossible. The rate of blasting is matched against the capacity to remove the rock where the permafrost is thin and drilling extends below it, water from any exposed melting ice accumulates in the drill hole, making the placement and firing of the charges difficult, again requiring careful timing for efficient operation.

Construction of berms for airstrips (or roads) in the Continuous Permafrost Zone is undertaken during summer, as that is the only time when fill can be obtained. During summer, thawing extends down into the surficial layers. After removal of the thawed surface material, a borrow site is abandoned for a few days until thawing has extended downwards again.Thus, a sequence of borrow pits is exploited on a rotational basis, in order to maintain a constant flow of material for fill. The runway was extended by end-dumping (to avoid scarring the soft surface of the summer landscape), with a depth of at least 3 ft. (0.9 m.). Large boulders, sands and shot rock were used for the bulk fill. Fine sand was not used for the topmost 2 ft. (0.6 m.) of runway surface because of its poor bearing properties under aircraft wheel loadings and because, like silty material, it can be blown away. Well graded material with a maximum 3 in. (8 cm.) particle size is best for the airstrip surface. This material is scarce in the site area. Wherever a pocket of good gravel was located in the esker, it was stock-piled separately for screening, to produce reasonably good grade material for surfacing the airstrip.

As the fill was laid down it was compacted. The surface course was best laid down 6 in. (15 cm.) at a time and compacted. Culverts were required to allow cross-strip drainage from a small lake which abutted against the airstrip. The culvert was completely surrounded with gravel, without boulders which may puncture the culvert. At least 4 ft. (1.2 m.) of fill was placed over the culvert. Local labour was used to hand-remove larger cobbles from the surface of the airstrip.

Disciplined traffic routing kept the disturbance of the delicate landscape surface to a minimum. Reclamation of disturbed land after the venture included the levelling of the borrow pits.

Warm Oil Pipeline Construction, in the Continuous Permafrost Zone.
The viscosity of crude oil has to be modified by warming in order to pump it through a pipeline. No oil pipelines have been constructed in the Continuous Permafrost Zone of Canada, and so the Trans-Alaska Pipeline will be used as an example of construction techniques that might be used if pipelines do eventually transport oil from the Beaufort Sea and Melville Island, where current exploration appears most likely to reveal significant discoveries. The oil at Prudhoe Bay rises from about 6,500 ft. (2,700 m.) at 60°C, and is kept warm by pumping and friction within the pipeline. The line had to traverse the Continuous Permafrost Zone. The pipes were welded internally and externally, and the welds inspected. The pipe was then insulated with fibreglass wrapping, in turn covered with galvanized sheet metal bonded to the insulation. This insulation is intended to preserve heat within the pipeline when it is working below design capacity, or when the line has to be shut down.

In the most sensitive area the pipeline was mounted on a shoe which slid on a teflon cross beam, elevated by supports to ensure that no heat from the oil

reached the permanently frozen ground. The pipeline had a zig-zag configuration to facilitate lateral movement over the cross beam, as the pipeline expands and contracts with the enormous seasonal temperature range associated with the Arctic. A gravel pad under the pipeline (separated from the underlying permafrost by a mat of styrofoam insulation) was extended to one side as a road for servicing the pipeline. Where necessary, the vertical supports were frozen in place by injecting a sand-water slurry. Also, where necessary, each support contained devices for drawing off ground heat to keep the earth frozen. In certain preferred animal crossings the pipeline was raised higher than usual to allow the passage of animals. In areas where there is a risk of earthquakes the cross beams were wider than usual to allow for more than the usual amount of lateral movement.

An above-ground pipeline is extremely expensive, and as soon as it was possible, the pipeline was insulated and wrapped with tape to protect it from corrosion, and then buried in a trench and surrounded by a sandy slurry which froze the pipeline in place. Refrigerated brine was pumped through the pipes buried beneath the pipeline to keep the ground frozen. Where the pipeline had to cross rivers it was trenched into the flood plain and held down with concrete saddle weights. Under the river the pipeline was coated with concrete.

Pumping stations, fueled from the oil, move the oil through the pipeline. Valves are intended to restrict the amount of an oil spill if the line is fractured. A servicing road was constructed alongside the pipeline (there is a debate now as to whether this road which allows access to the Arctic should be opened to the public). As with other forms of transport, the stability of the pipeline will have to be monitored carefully where the Continuous Permafrost Zone merges into the Discontinuous Permafrost Zone because of the great variability of the terrain.

Conclusions

The Discontinuous Permafrost Zone is especially sensitive to disturbance from construction activity because of the great variety of terrain and permafrost conditions. It is difficult to standardize engineering practices; whichever constructional procedure is adopted, it will damage one or other of the irregularly distributed frozen and unfrozen ground. It is impossible to change procedures in phase with the scale of changes often associated with the state of the permafrost.

Most constructional procedures peculiar to the north are directed at minimizing the transfer of heat into the ground, so that ice in the substrate is not melted. The ice imparts to the substrate its mechanical strength, and thawing of the ice can cause subsidence or reduce the substrate to a slurry, with erosion occurring on slopes, undermining any structure whether it is a road, bridge, pipeline or airstrip. A source of good gravel is very important in northern construction for helping to minimize disturbance of the landscape, and since it is scarce in many parts of the north, it should be used thoughtfully. Procedures developed specifically for northern construction are very expensive, compared with the south, and so there have to be equally specific social or economic needs.

Some disturbance of the permafrost is always produced by construction in the Canadian North. The principal aim of research into new constructional techniques is to contain this disturbance. Most terrain types in temperate

regions have a certain resilience, and some kind of recovery occurs after disturbance. Northern landscapes with permafrost are very susceptible to damage from construction activity, and the damage may become self-perpetuating if the containment policy fails.

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The Assessment of Industrial Impact on the Northern Frontier

E .R. Weick

Introduction

In this paper, I comment on the methodology of social impact assessment, and on the Mackenzie Valley Pipeline Inquiry (Berger Commission) as an example of such assessment. While the paper has particular relevance to the cross-cultural situation of the frontier, at least some of the things that it says could be regarded as having more general application.

The paper is based directly on my observations, experience and reading while I was with the Berger Commission, with which I worked for some three years. The views expressed are very much my own, and must in no way be viewed as reflecting the programmes and policies of the Department of Indian and Northern Affairs, or any other government agency.

I developed the paper out of concern that social impact assessment, as normally practised, is too ritualistic and narrow in its approach to complex problems. It would seem, at times, that impact assessment is used to limit our understanding of particular events or phenomena, rather than to help us decipher their broader and longer-run meaning. It is also very often misapplied. Techniques that make sense in one part of the country, say, in urban Toronto, may be largely inapropriate to regions such as the remote north, inhabited by people whose culture and values are quite different from those of Torontonians. Yet these same techniques are being used in such regions.

One of the outstanding problems of impact assessment is how to give proper analytical treatment to intangible and unquantifiable elements. Another is how values should be assigned to variables under conditions of uncertainty. The typical response of the analyst to such problems is to ignore them, and to deal with those elements of the analysis to which quantities can be assigned, and which can be estimated with some reasonable degree of definiteness. This is, of course, the same thing as holding a very large part of human experience in a "*ceteris paribus* pound", and one result may be that the assessment will not have come to grips with anything that is really important. This, unfortunately, is all too often what happens, with the result that political and industrial decisions having enormous consequences for whole populations, such as the native people of the north, are made on the basis of flimsy information, or on the basis of biases that no one has taken the time to dig into and reveal.

The fact that complex events are uncertain and defy quantification need not, in many cases, be the serious problem that analyses have made it out to be. If the agencies responsible for conducting assessments are willing to commit the

necessary resources and, as Judge Berger did, set in motion an imaginative enough process, values can be established despite the absence of numbers, and successive passes can peel off the layers of our ignorance about a problem until, being able to proceed no further, we are left with a pure, residual pool of the unknowable. Where issues as large as those posed by northern pipelines or hydro-power developments are at stake, that is as far as we must go. If we stop short, we are not conducting responsible assessment.

The Methodology of Impact Assessment

When we are assessing impacts, what assumptions are we making about society and its welfare, and the relationships that prevail among individuals, groups and the larger interest? In a special context such as the spread of industrial society into the northern homeland, what circumstances, relationships and oppositions must be given explicit recognition? What is the responsibility and role of the professional analyst toward ensuring that the general methodology and special techniques that are applied do indeed fit, and that all sides of the question are being examined?

Typically, the way in which a government department, or a private company (usually at the requirement of government), handles impact assessment is to use "experts" to examine a project under terms of reference that are restricted with respect to the possible consequences that can be considered, and with respect to the time frame within which these are studied. The resultant report usually interprets the data positively, so that the desired outcome, from the government or corporate point of view, is presented in the best possible light. All of this would seem to be a logical procedure from the point of view of the proponents of a project, what of the public that will be affected by it? Recently, there has been a trend toward subjecting major industrial projects to some form of public review, quite apart from the reviews that are normally conducted by established government tribunals. But if the terms of reference under which impact assessments, and public reviews, are undertaken are still narrow and constrained, or if devices such as tightly scheduled hearings are used to limit public input, the result will not likely be an adequate consideration of the problems that a project may raise.

In a critique of impact assessment published in 1973 (see bibliography), Marvin Manheim, of the Massachusetts Institute of Technology, discussed several problems that arose with much of the conventional approach. His commentary focussed on cost-benefit analysis, which by then had become overworked, hackneyed, and carved in stone. He pointed out that techniques such as cost-benefit analysis focus on aggregates rather than on differentials, that they are usually applied "post-facto", or only after projects have been planned and designed, and that they place the professional – the engineer, environmental scientist and economist – into the priest-like position of determining what is best for society. These points need not be restricted to a criticism of a particular technique. They easily lend themselves to generalization into a commentary on impact assessment as a whole, including its methodological as well as purely technical aspects.

The first of these points would seem to be the most serious. While the conventional approach recognizes that every social transaction involves some kind of redistribution (that there must be both losers and gainers), it nevertheless

focuses, not on this fact, but on the sum of all of the gains and losses. A "benefit" is defined as a positive increment in aggregate welfare, a "cost" as its diminuation. If a project is expected to increase aggregate welfare, than there exists a *prima facie* case for undertaking it, despite what costs may accrue to particular individuals and groups. And, in a world permeated by political expediency, *prima facie* cases are often regarded as sufficient justification to proceed.

The approach thus views the interests of society as homogeneous, it is predicated on the assumption of a similarity, and fundamental additivity, of values, perceptions and goals among all social groups. Thus the slum dweller and the millionaire are really in the same boat, except that one may be more comfortably seated than the other. Or, to put it into terms more in keeping with the theme of this paper, there is an assumed commonality of interest among pipeline builders, northern native people, and all Canadians, and everything will work out all right when we build the pipeline, if only we are clever enough to discover the nature of the common interest and to manipulate it to everyone's advantage.

An alternative view of society, that it consists of a heterogeneity of interests, would preclude the possibility of an aggregate benefit, or "aggregate welfare function." It would explicitly recognize that there are significant blocks or groupings of interests within a country or region, and that the normal relationship among many of these is one of conflict. These various blocks may or may not harbour common value systems and perceptions of welfare and the good life. Their objectives, insofar as they are able to articulate them, may differ so fundamentally that they are irreconcilable. An action which favours one group may have devastating implications for others, and may result in far more than a minor loss than those whose interests are damaged could, if need be, accept for the greater good.

A gain to the millionaire may result in a terrible loss to the slum dweller, and you cannot arrive at a net figure that encompasses the changed status of both. Or a gain to pipeliners, and those segments of society dependent on increased supplies of fossil fuels, could represent an enormous loss to Indians and Inuit in terms of further erosion, and perhaps eventual disappearance, of their language and way of life. But there is no valid way of combining the gains and losses into a single set of numbers that is representative of the change that both groups would experience because they occur within profoundly different value systems or "welfare functions." Thus, certainly in this case (and I think, in many others), aggregate social gains and lossess are theoretical fictions. They are meaningless because what we refer to as "society as a whole" is, in reality, a conglomeration of groups and interests that try, somehow, to muddle along and work things out, usually with a great deal of friction.

Manheim's second point, that impact assessments are normally undertaken "post facto", after the project has been conceived, designed and solidified in the minds of the planners and politicians, also presents a range of problems. Our industrial and institutional structure, our technology, and our past experience leads us to seek certain solutions and to exclude others, not because they are invalid, but because they are precluded from our vision. The solution of the hard pressed highways engineer is to build more expressways; that of the petroleum executive to find more oil; that of the government official responsible for northern employment programs to find more jobs for native people, and so on. None of

these people are sufficiently free of their perceptual and institutional inhibitions to question what they are doing. But in doing what they are, society and its technological structures become more distorted and complex, and the traps that they contain become more firmly rooted.

Conventional impact assessments do not reach far enough back into the history of a particular event or project. The highways engineer is unable to ask whether we want or need more expressways, and whether we want to become even more firmly committed to a society which is dependent on the automobile and complex and costly urban and rural road systems. He asks what we think of the road which he has most recently designed, if he asks at all. And, because we seem to express no awareness of, or preferences for, alternatives, that is the question that he should be asking. Yet there usually are alternatives worth exploring. Indeed, we must seek these out and examine them because the solutions which seemed so tried and true are now too often found wanting, and their cumulative effects could be disastrous.

Unless we are prepared to go back to the roots of a problem and to survey its full breadth and scope, we are in serious danger of wrongly identifying what we are trying to resolve. Let me give you an example of what I mean. Perceiving the problems of northern native peoples as arising out of poverty, the government has, during the past two decades, initiated many programs to increase industrial employment and wage income among them. The idea was essentially simple. Create enough job opportunities in the North (by, for example, developing mines, or building roads or pipelines), give the native people some training (such as operating heavy equipment), and the "poverty syndrome" will eventually disappear. This has not happened, nor could it have. The native peoples' problem was not one of poverty, but one of a beleaguered people trying desperately to hold their families and nations together in the face of intrusions from an alien, industrial culture which was, in many fundamental ways, antithetical to their own, and which, wherever it appeared, eroded or destroyed their own means of livelihood. The more they were hassled to take jobs or training, the more difficult it became for them to hold to their central purpose, the maintenance of their small societies and way of life. The analyst, however, looking at their struggle from the outside, misunderstanding its nature and being unaware of its history, would perceive as positive any increase in industrial employment or vocational training. These things would be assigned plusses in his cost-benefit analysis.

Let me turn briefly to another limitation of conventional impact assessment. Typically, impact assessments are focussed on the individual project, and do not take account of the cumulative effect of this project, plus all of the other projects to which it is related, or with which it coincides in some way. Thus, the methodology does not include the longer-term and broader-scale effects of development, but merely its specific and incremental effects. These are often neglibible parts of the overall process, yet it is on their basis that decisions get made, often irrevocably locking a region and its people into a particular developmental path.

Judge Berger did not only give consideration to a proposed gas pipeline, he extended the scope of his Inquiry to include questions such as an oil line paralleling the gas line, oil and gas development in the Beaufort Sea, and the construction of on-shore processing facilities in the Mackenzie Delta, because it was the combined effect of these things that would have transformed northern society and its environment. Moreover, the initial of these projects, the gas

pipeline, would surely have led to the others; you could not logically separate them. The single project might have been examined in isolation, but its impact would, typically, not have been large in comparison with the synergistic, cumulative impact of all the projects combined. Government did its own assessment of the social impact of gas gathering facilities in the Mackenzie Delta, and this stood in marked contrast to the approach that Berger used. The study concluded that the social impact of the gathering systems would be negligible. It was right, of course, but only because its focus had been restricted to the particular project *per se*. It was not permitted to examine this project as part of a larger sequence which would, over a short period, have greatly altered the social and economic character of the Delta.

This type of selectivity distorts rather than enlightens. It also attests to the lack of acceptance of methodologies that are big enough, to encompass a wide range of variables, a variety of conflicting interests, and a long span of time. Such methodologies are available, and indeed they are mostly common sense. Manheim himself proposed a four part assessment process that involved the goal-oriented interaction of politicians, the public, and professionals. The object was to involve all community groups that would be affected by a project, or that would have to make decisions about it, from the identification of a problem to its solution. It would provide for a dynamic, open-ended process that would allow issues to be pursued in whatever direction the community felt to be desirable, and in which no one would be able to stand away as observers. In its essentials, this was the method of the Berger Inquiry.

Let me now make a few comments about the role of the professional analyst in the impact-assessment process. Traditionally, the role of the professional has been an "elitist" one. It has been that of the highly trained person who sits at the pinnacle of society, who not only has a range of techniques at his disposal, but who has become imbued with the wisdom to appraise various courses of action on terms of their contribution to the "public interest." He has been the advisor to the politicians who must make the decisions, and his advice, being professional, has been perceived as "value free" or, at least, "value neutral." He is the person who undertakes cost-benefit analyses and who spins out the numbers on which important decisions are based. The fact that he comes from a certain segment of society, that he is university trained, and that he would often have little in common with many of the people that he is analysing, is not perceived as significant.

Recent years have seen a crisis centering on the credibility of the professional. The kind of impact assessment which allows the professional class the status of an elite priesthood can no longer be considered as valid. The professional must do more than occasionally descend from Olympus with a questionnaire, and a bag of clever techniques; he must be prepared to stay down below and use the full range of his skills, communicative as well as technical, to advise whoever is in need of advice.

How is this to be done? Let us again view society as groups in conflict, but groups which must nevertheless do some things together. What one group may want is viewed as antithetical by others. If a road is pushed through a neighbourhood, or if a pipeline is built along a certain route, some groups may view it as disastrous and others as beneficial. In their own terms, all of the groups are right, but those that will prove "most right", that will ultimately win the day, are

the ones that have the necessary resources behind them. And in today's technical world, a very important component of such resources – perhaps the most important – is the number of professionals at the disposal of a group, and the skills they possess.

If one is concerned that solutions to social problems should become more rather than less egalitarian, then the obvious answer is to spread the resources around. Government has already done this to some extent. For example, it has seconded professionals to native organizations such as the Quebec Inuit Association in connection with land claims negotiations, and has funded other native organizations to hire their own professional staff. But this process has not gone nearly far enough. Conflicts over whether, and how, major projects should be undertaken are still highly unequal. The power still lies with the bureaucracy and large corporations, entities that can afford large stables of analysts and lawyers. The capability of public interest groups to undertake "counter impact assessments" remains decidedly weak.

The Example of the Berger Inquiry

The north has seen many impact assessments, most of which have suffered from the errors and misconceptions described in the foregoing pages. However, one impact assessment undertaken in the north, the Mackenzie Valley Pipeline Inquiry, has set new standards not only for that region, but for the country as a whole. I do not intend to say a great deal about the Berger Inquiry, but I must nevertheless deal with it briefly because of the example it provides.

Essentially, the methodology of the Inquiry was the adversarial process of the courtroom. But, as we have come to learn from generations of unequal battles in the courts, this process, as sound as it is, has some serious limitations. It is open to manipulation by the clever and powerful, and can work to the advantage of some, and against others. Judge Berger was able to make the adversarial process work for him because he knew its weaknesses, and the success that his Inquiry enjoyed was due, in considerable measure, to the fact that he was able to devise ways of overcoming these.

All in all, the Inquiry became a microcosm of the real world on which the pipeline bore, and which continued in full play beyond the Inquiry's confines. This was a world of the last great wilderness and of the encroaching industrial frontier, of sick cultures struggling to recover themselves, of people desperately awaiting payoffs from their small businesses, and of the commitment of enormous resources to a single project. But all this was held beyond the walls that Berger had so masterfully built. The storms that raged outside were at issue, but the atmosphere that prevailed within the Inquiry remained that of the polite, even boring, restraint of the courtroom, where lawyers cleverly lay their traps and insult each other, but still remain gentlemen and friends. And, perhaps most importantly, given the divisions in our society, people that would ordinarily not make it past the Arctic Gas doorman were, within the Inquiry, able to converse amicably with corporate presidents and vice-presidents.

Arctic Gas and Foothills, the rival pipeline proponents, had enormous resources at their disposal, and presented varied and comprehensive evidence on the environmental and technical aspects of the pipeline. Their socio-economic evidence was, however, largely conventional stuff, and was aimed at convincing government that the pipeline would, both directly and indirectly, make a strong

positive contribution to employment and income in the Mackenzie Valley and Delta. The model that both pipeline proponents used was one that saw native subsistance activity, and the native way of life, as passing, and as requiring replacement by something that was viable in the long-run. The pipeline, and the kind of additional industrial activity that it would engender, would, it was argued, provide an economic base for the affected regions well into the future. From hindsight, it is easy enough to say that these two large corporations, with all of their resources, should have had a more realistic picture of the northern economy, and of the continuing role of subsistence activities within it. But, at that time, everyone except the native people shared the myth of passing of the traditional economy, and very few people had as yet learned to pay attention to what the native people were saying.

Pitted against Arctic Gas and Foothills were a small cluster of native organizations which seemed to represent only tenuously united constituencies. Advocates of the Mackenzie Valley Pipeline delighted in pointing out that many native people had said that they wanted jobs on the project, and other things that detracted from the notion that there was a strong native interest under threat. From the vantage point of Ottawa, Toronto, Calgary, and even Yellowknife, it was easy to doubt, and dismiss, the central points that the native organizations were making – that their constituents feared that the pipeline would have such a pervasive impact on their lives and futures that it simply could not be built until they were ready for it. And being ready meant they would require a negotiated settlement of claims, and sufficient time to implement the provisions of the settlement.

But while the organizations could be doubted, the people could not. The hearings that Judge Berger held in some thirty communities of the NWT and Yukon were the keystone of his Inquiry. Without those months of travel and patient listening, the Berger report would simply not have been credible as reflecting the group interest of northern native people. There is a roomful of transcripts containing the hopes, fears, and aspirations of the many hundreds of people, young and old, that spoke in the native communities of the Mackenzie Valley and Western Arctic. Suggestions that the Berger report is not based on views of the people require only one answer: Let the critics go and look themselves.

If the community hearings were the Inquiry's keystone, the formal hearings, held mainly in Yellowknife, provided the analytical building blocks from which the Judge eventually constructed his conclusions and report. Reaching decisions on something as large and complex as the pipeline required the development of a great deal of information, and the assurance that all sides of many complex issues would be examined. There was no question that Arctic Gas and Foothills would be heard; they could buy whatever expertise they needed to make their cases. But the native organizations were already strained to the limit in preparing their claims. The funding that the Inquiry provided to enable such groups to prepare formal evidence, on subjects as diverse as native land use and the historic origins of the native predicament, was small in comparison with the quality and volume of information that it yielded. The Judge's ruling on disclosure, requiring that all relevant reports and documents be made public unless it could be proven that they should remain privileged, further added to the stock of material available to the Inquiry. Again, those who have argued that the Berger report is not backed up by well documented evidence need only to go and look.

But perhaps the most important point to make, in terms of the art of impact assessment, is that Berger did not set things up so that the participants to the Inquiry had to address him, he established a process in which they could address each other, and in which he could listen to the debate. It was out of the challenges that the participants posed to each other, and the responses to these, that the substance of the Berger report was fashioned.

The concerns and content of the Berger report encompass a long period of time, and an enormous complexity of events and social processes. While the focus is on the pipeline, this project is viewed as only one step, although a very major and perhaps final one, in a long history in which native people, and the resources on which they depend, have been pushed back and marginalized by our industrial frontier.

That is precisely the way in which the native people of the Mackenzie and Western Arctic saw the pipeline. They could not look upon it as a temporary disturbance to their way of life, one that would soon go away, leaving the world only a little better or worse than before. They saw in it an indication that what had already happened to native people all over the North American continent was about to happen to them. It was the harbinger of their destruction as a distinctive people, free to pursue their way of life as they always had. For Berger to ignore this central concern and to focus instead on short-run concerns such as the number of jobs that the pipeline could provide, the specific damages that trappers might incur, or even how much more alcohol native people would consume, would not have been responsible under the circumstances.

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Myths and Futures in the Yukon Territory: The Inquiry as a Social Dragnet

Julie Cruikshank

The Canadian North has always had an ambiguous place in Canadian mythology. Mythology usually clarifies relationships between individuals and society, but Canadians have never been quite sure how to relate individually or collectively to the North, or how the north fits into Canadian society, so their northern myths have been kept simple and expedient. The old myths were full of contradictions: the north was simultaneously an inhospitable wasteland and a resource-rich storehouse, a dark mysterious wilderness to be avoided and a colony to be exploited, a land of the past and a land of the future. These southern myths were relatively harmless for northerners prior to the days of northern development, but under pressure of current pipeline plans they are being rewritten with new enthusiasm.

The new Canadian myths of the north arise partly as a result of an increasing interest in topics such as the national interest, regional identities and cultural minorities. They are fostered and transmitted by the media, by government inquiries and by proponents of massive hydro projects, smelters, mines, and gas and oil pipelines. Like the earlier myths they still embody contradictions: the north is sometimes 'frontier', sometimes 'homeland'. These myths are more serious because they are becoming a basis for government and industrial activities in the north.

Northern Inquiries and the Alaska Highway Pipeline

The seventies will be remembered by northerners as the Age of Inquiries. A series of task forces, standing committees, hearings and pipeline inquiries have travelled to northern communities to discover the 'real north' and in their own ways they have gone some distance toward showing that the north has not just one or two but many faces. They have also given northerners a forum for developing and articulating some of their own values, plans and hopes for the future.

The Mackenzie Valley Pipeline Inquiry, headed by Justice Thomas Berger has undoubtedly been the most serious inquiry, the greatest single attempt to give a human face to the north.

On March 21, 1974, Canadian Arctic Gas Study Limited applied to the National Energy Board to build a gas pipeline to carry gas from Prudhoe Bay, Alaska, across the northern Yukon and up the Mackenzie Valley, a route which had already been under study for five years, since 1969.[1] The same day, the Government of Canada appointed Mr. Berger to conduct an Inquiry into social, economic and environmental impacts along the proposed route. During three

years of hearings and report preparation which followed, his Inquiry effectively argued that the Northwest Territories must be a homeland first and a frontier second.[2]

By contrast, the haste with which Foothills Pipe Lines Ltd. applied for and received its permit to build a competing pipeline through the southern Yukon is almost indecent. On May 5, 1976, Foothills Pipelines (Yukon) Ltd., Alberta Gas Trunkline, Westcoast Transmission Co., and Northwest Pipeline Corporation agreed to sponsor a pipeline to transport gas overland across Canada to American markets. Four months later, they completed their initial research and filed applications with the National Energy Board and the Department of Indian Affairs and Northern Development for permission to build the Canadian segment. Although the National Energy Board then held hearings on the Application and identified several deficiencies in that Application, the federal government delayed eight months before establishing the Alaska Highway Pipeline Inquiry. This new Inquiry was instructed to complete all hearings and submit a report on the social and economic implications of the Alaska Highway project and the attitudes of Yukoners to the project in only three months. The federal government appointed Dean Kenneth Lysyk to chair a three-member board; the Territorial government appointed Mr. Willard Phelps, and the Council for Yukon Indians appointed Mrs. Edith Bohmer. The Minister also promised that if the Alaska Highway proposal were approved in principle, the Government of Canada would then establish a second, fuller Inquiry to produce a final socio-economic statement. This second Inquiry would form the basis for deciding the terms and conditions under which the pipeline could be constructed and operated.[3] It was the promise of a second inquiry which convinced many groups and individuals to participate in this first set of hearings.

As an indication of the Government's lack of seriousness about the Alaska Highway Pipeline Inquiry, the National Energy Board recommended approval of the Alaska Highway route on July 4, 1977, ten days before the Inquiry had completed its hearings. Since then the question of when or whether the promised second stage hearings will be held has never been clear. On May 4, 1978, Mitchell Sharp gave the first official assurance that there would be a second stage inquiry; however, on May 10th, the Northern Pipeline Agency released a draft of socio-economic terms and conditions prepared in Ottawa. It seems unlikely that a genuine inquiry will fit the government's timetable for development.

The Alaska Highway Pipeline Inquiry held formal hearings in Whitehorse and community hearings in seventeen Yukon communities between May 11 and July 15, 1977. Between five and six hundred people spoke at the informal community hearings. The Inquiry submitted its final report, as directed, on August 1, 1977. Because of time constraints and political pressures, the report of the Alaska Highway Pipeline Inquiry is essentially an administrative report, a rationalization for decision makers already committed to large scale development in the Yukon Territory.

The authors argue that there is a community of interest in the Yukon which overrides ethnic boundaries and includes both Indians and Whites, and that this results in a common identification as 'Yukoners'. They state that the majority of Yukoners are not opposed to a pipeline provided "certain preventative or mitigative measures are adopted to lessen the possible dangers of the project".[4] While this is conceptually and administratively attractive, it ignores both the reality

of life in Yukon communities and the distinctively different arguments which were made at the community hearings. Ignoring or denying differences does not make them disappear.

The Inquiry staff chose a politically expedient route, arguing that the Yukon is 'almost' ready for pipeline development. They did, however, recommend four 'preventative and mitigative measures' – a $200 million heritage fund for the Yukon, immediate creation of an impact information centre and a $50 million advance on land claims to the Council for Yukon Indians. None of these recommendations has been implemented to date, ten months later.

It would seem that this projection of the Yukon's industrial future is acceptable to observers in southern Canada.[5] The environmental and southern support groups so actively involved in challenging pipeline development in the Mackenzie Valley have been notably silent about an Alaska Highway pipeline. The pipeline legislation speedily passed through the Canadian Parliament and Senate. Perhaps Canadians still find it easiest to settle for uncomplicated opposites in their northern mythologies – a Dene Homeland in the Northwest Territories and a Frontier for large scale industrial development in the Yukon.

Many Yukoners feel that the Lysyk report seriously misrepresented their views. Others who agree with the content feel betrayed because none of its major recommendations have been implemented. Despite its sometimes facile conclusion, though, the Inquiry's greatest impact may have been its function as a social dragnet: the Inquiry forced people living in the Yukon to reflect on their history and to think about and articulate *their* myths of the future and their reasons for living in the Yukon. Their views, often spoken forcefully at the hearings, present a range of possible futures for the north and often conflict with one another. But the very fact that they have been spelled out suggests that it may be possible to make some statements about the development of distinctive northern myths, values and lifestyles in the Yukon today. Some of these mythologies are quite different from those projected on the north by southern Canadians.

The Yukon Context for Industrial Development

Canadian myths of the north and Yukon myths of the north may differ, but they both spring at least in part from historical events.

Archaeological evidence suggests that the first inhabitants came to this part of North America via the Bering Strait at least 30,000 years ago. Throughout their history, Yukon natives were hunters and fishermen who adapted successfully to the sub-Arctic by carefully harvesting the resources from large areas of land. They spoke Athapaskan languages related to those spoken throughout North America. They have lived and worked in flexible matrilineal family units much of the year and in larger fishcamps in summer. Political leadership was never institutionalized apart from kinship, a 'chief' being the ranking male representative of his lineage.

A world view still fundamental to Indian mythology stressed the need for harmony with all beings in the natural world. Each individual grew up with a clear understanding of what was expected of him or her. Two outstanding Athapaskan characteristics which have persisted to the present day are an ability and a willingness to adapt to new situations and a co-operative ethic which encouraged self reliance while ensuring that there was a social network to fall back on for the sharing of resources.

The Yukon's recent social history is largely a history of rapid developments and readjustment to those developments and its recent mythology emerges from that history. The fur trade was felt in the Yukon 200 years ago when traders on the Pacific coast encouraged the coastal Tlingit to act as their middlemen by extracting furs from the interior. The native trade patterns were so entrenched by the mid nineteenth century that the Hudson's Bay Company never managed to gain a foothold in the southern Yukon. The first major influx of Europeans came with the famous Klondike goldrush which brought more than 30,000 strangers to the country for a few years and planted the myth of the Yukon as a frontier. The men who came to the Klondike and who wrote about it styled themselves as rugged individualists, single-handedly challenging the wilderness. They nourished a rather unrealistic but attractive view of the Yukon experience in archetypic man-against-environment themes, a legacy which has remained with us until today. The Indians had long before learned to work with, rather than against, the environment and must have sometimes wondered at the enthusiastic naivete of the men they sometimes rescued and frequently fed.[6]

Indians living at the mouth of the Klondike River suffered the greatest impact from this 'rush' on the North: those further afield looked on and even participated by guiding, packing, selling meat but after the gold rush was over they carried on much as before. The 30,000 strangers melted away in a few years leaving approximately 4,000 people in the Territory, over half of them of Indian ancestry.

One significant impact of the goldrush was the creation of the first regulatory agency in the Yukon designed (however well or poorly) to serve local interests and to protect those aspects of local life and culture deemed worthwhile. The essential division of authority between federal and territorial levels of government established at that time remain to the present day. Seventy five years later the Territorial Council is still operating in a largely colonial context.

For fourty years after the goldrush, the population was relatively stable: the Indian majority accommodated the white minority and sometimes intermarried with them. Most whites were willing to learn from Indians and relations between the two groups seem to have been respectful most of the time.

The second 'rush' came about as a result of the second world war and the belief that an invasion of North America might come from Japan. Again, almost overnight, 30,000 men descended on northwestern North America and in eighteen months they had completed a permanent 1500 mile road from Fort St. John, British Columbia through the Yukon to Fairbanks, Alaska.

The highway brought new settlers to the north, some of whom have remained to the present day. They set up businesses along the highway and helped build new communities where none had been before. The white population had continued to increase since the highway was built, permanently altering the ethnic and cultural composition of the Yukon.

Some of the disruptions and the dislocations this highway construction caused Indian people have been documented elsewhere.[7] Accompanied as it was by construction of other roads, airports, construction of a refinery, and an expanding federal government presence in the north, the Alaska Highway marked the clear beginnings of cultural breakdown for Yukon Indians. Ironically, shortly after the highway was constructed the bottom fell out of the fur market. Indians were encouraged to move from the bush settlements along the highway where they remain today. Again, government regulatory agencies were

introduced, particularly to administer social welfare services. While the intentions may have been good, the arrangements have been unsatisfactory since the people thus regulated had no opportunity to participate in the structuring or policies of these agencies. Ultimately these new institutions have removed social, economic, political and educational functions from the realm of kinship. By so doing they have undermined the collective arrangements which traditionally maintained Indian culture.

Over the last thirty years it has become increasingly difficult for Indians to defend their way of life as highways, tourists, parks and mines push them more and more to an industrial lifestyle. Indians are presently engaged in land claims negotiations with the federal government which they hope will redress past wrongs and give them legislative assurance of a more visible political and economic role in the Territory's future.

All communities in the Yukon will be affected if a pipeline is constructed whether they are along the corridor or not. But the eight communities along the route will be most directly affected. Although the implication is in the pipeline Application that one rural community is the same as another, these eight communities can only be characterized by their variability.

The majority of people in the Yukon live in Whitehorse (population 13,311) which includes a large number of both native and non-native residents. The remaining communities along the corridor are Watson Lake (808), Upper Liard (580), Teslin (241), Haines Junction (268), Burwash (60), Destruction Bay (80), and Beaver Creek (170).[8] Watson Lake, Destruction Bay and Beaver Creek are predominantly white communities; Teslin and Haines Junction include equal populations of Indians and whites. Their histories are different too: Watson Lake, Destruction Bay, Burwash and Whitehorse are post-highway communities; archaeologists date communities around Kluane Lake at roughly 8500 B.P.; Teslin long predates the highway; Haines Junction is on an old trading route.

Any assessment of how a pipeline will affect these communities must include both a structural assessment of each community's capacity to absorb changes and also an internal assessment of the views of its members. No such evaluation has been provided either by Foothills Pipe Lines (Yukon) Ltd., or by the Alaska Highway Pipeline Inquiry. However, the hundreds of pages of transcripts from community hearings at the Inquiry could provide a good starting point for an internal evaluation.

Myths and Futures

Because the idea of a gas pipeline was thrust so suddenly upon the consciousness of Yukoners, many people were still reacting with some confusion when they spoke to the Inquiry. Very few people had any comprehensive information about the project and the questions they asked of the Inquiry were referred directly to a Foothills employee who travelled with the Inquiry and who clearly had his own biases. The chief at Burwash expressed his frustration with this at the Inquiry, pointing out that "that's only one side of the story we heard."[9]

Because they lacked clear information, many of those who spoke talked more about their vision of the Yukon's future than about the pipeline. In their testimony, the pipeline became a symbol of anticipated spinoffs – fast money, community growth, large scale industrial development, community destruction, poverty – depending on their individual perspective. Many of the presentations involved a

good deal of introspection, personal reflection, and emotional conviction, and thus revealed something about local mythologies.

Myth is a statement of the relationship of individuals to society in the present and future. Mythologies may link people both to local traditions and to a larger philosophy. People do not invent myth as an escape from reality; it *is* their reality. They may use their myths to try to impart a direction to the future. A whole literature of mythology describes "the influence of contrived....mythologies and inflections of mythology on the structure of human belief and the consequent course of human civilization."[10]

When Yukoners describe their vision of the future they are really talking about their own mythologies. Some have been developing over hundreds of years in this region; others are heavily influenced by recent history. What makes the newer mythologies distinctive is their presentation of alternatives other than fast dollars and rugged individualism. Following are six perceptions of the Yukon's future in relation to the present which are reflected in the Alaska Pipeline Inquiry transcripts.

Perhaps the only people who really understood what the Inquiry was all about were the older Indian men and women who spoke, usually through an interpreter, at every community hearing. They understood that the Inquiry was not about a pipeline but about mythology and they tried to talk about their own world views in a way they could only hope the Inquiry would understand. Sometimes the speaker just began talking about the old ways through an interpreter. Other times the interpreter introduced the speaker, as in the case of a Teslin woman with, "she is an old timer and she says she is going to go into it like a legend".[11] Speakers talked about how the people used to live, about the year the summer didn't come, about the great flood.[12] What they were saying might be paraphrased as, 'You have asked us to come to talk to you. You must want us to tell you about our world because that is what we know. This is how the world works and you, as visitors, should know before you try to change it again'.

While the Inquiry staff listened politely, it is never clear whether they understood the meaning behind the words. The talks seldom included more than a sentence or two about pipelines but they described a world view in which there had once been harmony where it was now absent. The oldest man in one village even testified twice – once against and once in favour of a pipeline, in each case talking mostly about his own life and the land. What he seemed to be saying was that there had once been a sense of balance in life and there wasn't any more and although he didn't understand all the implications of 'pipeline', he was in favour of whatever could restore some balance in his world.[13] Another woman broke off her presentation to point out, "It's pretty hard for us to make up our minds right away just like you turn over a cup".[14]

A young man recounted a widely known myth of obscure origin but attributed to a Pelly River shaman, now dead. It had the clearest message for the Inquiry.

> '...he said that he saw many white people coming to this land and that they will build trails to travel on. He said they will block off waterways and they will tear up the land to take out rocks....lastly he said they will build an iron road that will not be driven on. And he said, when this happens,...it will be the end of the Indian people."[15]

Most older Indian men and women do not distinguish between their personal life

history and a shared mythical history. They are inseparable. Their relations to the land in a spiritual, temporal and metaphysical sense are deeper than most whites can understand. Their movement has been circumscribed to such an extent that they now remain in villages much of the year. Their mythology continues to make what sense there is of their daily lives, hemmed in as they are. Concluding testimony from Copper Lily Johnson of Burwash, a translater summed up the lack of balance. She said, "I feel like a tied up old dog here. I can't go anywhere anymore."[16]

A second group of Indian speakers included men and women of indeterminate middle age who have their roots in the villages even though they may have lived in Whitehorse for part of their lives. They were born before the last big boom – the construction of the Alaska Highway in 1943 – and lived through the changes it brought to their families and their lives. This Inquiry resurrected a whole series of memories for them because it involved a major construction project of similar dimensions along the same route.

The people who spoke to the Inquiry are becoming politically involved at this time of their lives through land claims discussion; in fact, their presentations were often an extension of that political involvement. They are aware of the realities of the boom myth, the long work involved in picking up the pieces of their lives after the inevitable bust. The two guiding images which seem to structure their talks are the memories of a better life before the construction of the highway in the past and the vision of a better society after land claims in the future. Both images project an ideal which contrasts sharply with much of their life experience.

They frequently began their talks with reference to a time before the highway when life was more balanced. They listed some of the destructive affects of Alaska Highway construction: epidemics, violence, sexual abuse of woman, alcohol abuse, disturbance of game. They described the effects of government interference (regulatory agencies in current jargon) which followed the highway: their consolidation in roadside villages; the introduction of government programs for transfer payments; hunting, fishing, trapping and wood cutting restrictions; the creation of parks. All the interventions have helped to erode Indians' social and cultural tradition.[17] Although the Alaska Highway Pipeline Inquiry Report specifically rejected the suggestion that there may be parallels between Alaska Highway construction and Alaska Highway Pipeline construction[18] these people repeatedly stated the theme: 'This is what happened last time. We cannot predict what will happen this time. We have only our life experiences by which to judge'.[19] They repeatedly pointed to land claims as their only opportunity to gain back some control over their collective future.

As with the older people, they talked about the land, but they also talked about their mistrust of government promises:

> "How can you as government promise our people we will not be affected? You promised before and these promises have been broken. The people are living on welfare and the white people thought it was a good thing, but why didn't they ask us instead of thinking for us? Are we animals that we cannot think for ourselves? The land is our string to hold onto."[20]

The land is the thread out of the labyrinth in which they find themselves. They are the permanent residents of the Yukon and expect any money from a construction boom to fall to transients who will leave anyway.

> "I feel like I was planted here like a forest tree and raised here, not going nowhere and just sitting here like a plant and getting old and I know I'm going to die here, I'm not going to die somewhere else."[21]

Some of this age group who have watched the patterns repeat themselves but who have also worked with whites, tried to assess the overall impact of periodic booms in terms which whites could understand. One Indian man stated:

> "I'd like to point out that a lot of the people that have been so outspoken in favour of this project have come to the Yukon and looked at the Yukon as a profitable frontier. I don't think that's a Yukoner. I think a Yukoner is a person that's been here and treats the Yukon as a home, not as a profitable frontier."[22]

Another expressed his frustration with the way the pattern has repeated itself over and over:

> ". . . everybody . . . comes up to the Yukon. They say, Oh I want to get away from that rat race down south, I want to get up here where it is calm, there's lots of game, I can fish and this and that. Now all of a sudden . . . they ask lets bring in all the development that's possible. It's the people that's going to make their home here that's going to have to pay the high price after the thing is done."[23]

A third group of speakers at the Inquiry is fast becoming the most politically articulate group in the Territory. They are young Indian men and women in their twenties and thirties who spent their earliest childhood with their families after the construction of the higway, somehow survived the traumatic years in residential schools, sometimes managed to leave the Yukon to obtain either post secondary education or work experience 'outside' and have returned to work in the communities. Ten or even five years ago people with their backgrounds were being urged to return to 'work with your people', usually meaning 'become a teacher or social worker in one of the existing bureaucracies'. Joining a system which had helped to erode their culture appealed to very few, but since 1970, Indian political organizations have provided a more acceptable vehicle for their intellect and energy. The training they are receiving in their organizations ensures that they will soon be playing more visible roles in Yukon political life.

Their presentations to the Alaska Highway Pipeline Inquiry reflected the mythology of their grandparents, man's blurred relationship with the land where one blends into another and harmony is easily disrupted when men do not treat the land with respect. 'We spring from the land, we know the land, we can live on the land' was one theme.[24] Their talks were sometimes closer to poetry than prose,[25] were sometimes emotional,[26] sometimes expressed a 'learn to live with less' philosophy.[27] Many of them are used to making presentations of this kind, and in doing so are creating a new mythology of the future which is attracting even younger Indian people. They were not intimidated by microphones, bright lights or cameras at the hearings and were more outspoken than their parents. They are the group designated by their pro-development opponents as the 'young radicals'.

Mythology ties people both to their own roots and to a broader human community. To have any meaning at all, it must clarify both the past and the future. These young people can identify both with their own local historical traditions in

the Yukon and with a more general movement by Indians elsewhere in North America. At the Inquiry they spoke of their relationship with the land in the past and tied it directly to management of renewable resources in the future. They spoke of erosion of their rights by centralized government in the past and tied it to their vision of a more decentralized political system in the future. Their understanding of the past translates directly to a vision of the future. And their vision of the future is bound inextricably with land claims as symbol of a new beginning, a renewal.

Juxtaposed against land claims is an equally strong symbol, the pipeline, which poses the greatest single threat to an orderly implementation of whatever terms are agreed to in a land claims settlement. At the Inquiry they argued that a pipeline now will work against a land claims settlement in several ways. It will attract more whites who will further engulf the diminishing Indian minority. This in turn may increase racial tensions between whites and Indians, weaken Indians' arguments for cultural and language programs in schools, and pre-empt land they may want to select as part of their claims. A pipeline may drain off manpower and energy which would otherwise be focused on making an Indian land claims settlement work. In sum, a pipeline now could undermine all the work Indian organizations have been doing in the villages since 1970.

Although the Lysyk report interpreted these people as saying simply 'no pipeline until land claims' the message in the community hearings was sometimes more explicit: that the moratorium they requested is not just a delay in the pipeline but a delay to think about *whether* they want a pipeline.[28] They pointed out that at the basis of their land claims settlement are plans for community enterprises offering an alternative kind of economic development which could benefit both Indians and non-Indians. They argued, further, that capital intensive industrial development does not, in the long run, benefit Yukon communities or even the established white business interests in Yukon communities.[29] One of their basic concerns is how community enterprises will be able to develop and grow if competing industrial developments like a pipeline draw off labour and talent from the communities.[30]

A fourth category of speakers at the Lysyk Inquiry is in some ways the loose counterpart of the young Indians; however, these people can in no way be characterized as a group in a political or economic sense because their numbers are so diverse. They tend to be white, and in their twenties and thirties or even older. They live scattered throughout the Yukon but many also live in and around Whitehorse. As one stated at the Inquiry:

> "All I'm doing is representing a group of people, the size of which I'm not sure and perhaps it is more your duty to find out how big a group that group really is."[31]

What does link these people is their mythology, and what characterizes their mythology is their reasons for being in the Yukon. In their individual ways they are trying to live out some aspects of a 'northern lifestyle'. They include a diverse group of trappers, wage earners, self employed business people, young professionals, environmentalists – all people who came to the country and have decided to stay. Many of them are highly educated and have left professional or job security in the south and have accepted a lower standard of living than they might have enjoyed elsewhere. Some have built cabins in the bush and have

carved out a distinctive lifestyle for themselves. Most of them have rejected routine jobs and are making an attempt to respond to the compelling physical constraints of the north by working in ways which allow them to get the most out of each season. Their vision is not as collectively developed as the Indian political vision but it is not incompatible. Both stress the need for increased reliance on renewable resources, for decentralization in government, and for emphasis on human values in any development.

These people are emphatically not in the north to make money. The pipeline directly challenges the way of life they have come to regard as valid. Their vision of the northern frontier is that it can be turned into a homeland and their philosophy might be summed up in the words of one woman:

> "This Territory is a homeland, not a frontier to be exploited. Let's keep it a homeland rather than an industrial supply corridor for the U.S."[32]

This 'group' has perhaps the greatest potential for expanding and changing the mythology of the north. They live scattered throughout northern British Columbia, the Yukon and Alaska and a literature is slowly developing about them which though sometimes skeptical is appreciative of what they are trying to do.[33] A whole style of northern music has emerged from this lifestyle in the last decade, perhaps most evident at the annual Faro Folk Festival in the Yukon.

Their idealism came through in their testimony to the Alaska Highway Pipeline Inquiry as they described the things they valued about the Yukon, a slower pace of life, access to wilderness, some degree of self-sufficiency. Some are survivors of the late '60's back-to-the-land movement, and have learned to mix and match the skills needed for survival. The climate quickly sorts them out: the ones who stay determine the particular 'mix' of urban-rural which gives them the lifestyle they want.

These speakers stressed the need for alternatives – in energy sources, in kinds of economic development, in ways of living. They posed an interesting contrast to the business community's concern about the drain of young people if the Yukon does not have industrial development. Tension between this group and the pro-pipeliners was most evident in Haines Junction where they were classified as 'hippies' and 'layabouts' who like Indians 'want to stop progress'.[34]

Their fundamental objection was not to a pipeline, but to what it symbolizes, the lack of any long range development plan for the Yukon and the assumption that the north can continue to serve as southern Canada's industrial frontier.

> "As long as we have population growth we expect to have economic growth, but let's keep it in line with the pace of normal growth resulting from people who come here motivated by a desire to live here harmoniously and not the conscious growth resulting from pure economic motives of people reaping their rewards and leaving it in a total bust."[35]

Many of them support the concept of an Indian land claims settlement as a more rational approach to economic development.

> ". . . so much alternative economic development could flow from it. To develop the Yukon in a way that we could all live with . . . requires the settlement of land claims first."[36]

The potential for growth of this mythology kept coming out at the hearings when

men who were clearly eligible for jobs on the pipeline spoke against it, for example in the words of a Teslin construction worker:

> "I'm a construction worker myself . . . I stand to profit if the thing goes through. It doesn't matter really. It's only a short term profit and in the long run it's more important to have a community that has its roots solidly established and that has a way of communicating with itself and with each other. Those are the important things. The money comes and goes, you know." [37]

Another man prefaced his remarks by saying that he had come to the Yukon four years ago to make money but had changed his mind:

> "If we allow the pipeline how much more industry is going to come as an indirect effect of the pipeline. If we see the pipeline come here, we get energy, we're going to allow more expansion for more industry and our socio-economic and environmental problems will increase and for those reasons alone I don't want to see the pipeline come through."[38]

While these people are sure to become greatly outnumbered during any construction project, their potential for change is more likely to come from a contribution to a new northern mythology than from any political or economic power they may yield now or in the future. In a territory with only 22,000 people, a few clear choices can be particularly audible.

A fifth group of speakers to the Inquiry constitute a genuine political and economic force in present day Yukon communities. These are the business people who enthusiastically support the pipeline. Although they undoubtedly recognize personal gains to be made from the pipeline, this group characteristically supports its stand with arguments about what the pipeline will bring to their particular community. Their presentations suggest that they are completely confident that their hopes, aspirations, likes and dislikes are the same as those of the community as a whole. They appear to be personally affronted by concerns raised by environmental and Indian groups. They style themselves as moderate proponents of progress. In fact their views have prevailed in the recent past in the Yukon and they are probably correct that theirs will be the viewpoint most commonly held in the future should the pipeline be built. The future they envisage for the Yukon is one with communities not unlike those they left behind in the south.

These people, too, embody a northern mythology which is coliquely reflected in Canadian fiction about the north as well as in present day lifestyles of many northerners. Whatever individual personal reasons initially compelled them to go north, when they arrived in the mid-twentieth century they found not a land of individualism but a land of intensive community values created by people quite like themselves. Because of a predisposition to recreate that which they had left behind, these people have in turn imported many of the fundamental Canadian virtues – hard work, persistance, self restraint – and have made these virtues an identifiable characteristic of one sector of every Yukon community.

There are two general 'categories' within this group of speakers at the Inquiry, but they are fundamentally in agreement. Some take what might be called a liberal optimistic viewpoint, that social benefits will flow automatically from the pipeline. Others take a more conservative perspective: they can identify the benefits they hope a pipeline will bring to their community, but they are less willing

to operate on good faith alone and want the benefits spelled out and guaranteed. Many of their presentations are made on behalf of organizations rather than as individuals. The Inquiry format is extremely appropriate for community minded businessmen; they share none of the discomfort some individuals experience while speaking publicly, and in fact their views do predominate in the final Alaska Highway Pipeline Inquiry report.

These perspectives are expressed quite clearly in two small communities along the Alaska Highway. The business community of Haines Junction, 100 miles northwest of Whitehorse presents a good case for the liberal optimistic view; the businessmen of Watson Lake, 300 miles southeast of Whitehorse are more guarded in their optimism.

The brief of the Haines Junction Businessmen's Association to the Inquiry presented a settlement history which was exclusively a history of business development in the community. They argued that, as the business community, they felt sure they had the expertise to assess the social and economic implications of pipeline construction.[39] According to their presentation, past developments in the area have had no detrimental social affects on the community and they do not expect future developments to cause problems. They do not mention that a recent hydro-electric project near Haines Junction flooded a very old Indian community and large areas of hunting and trapping territory, forcing the remaining inhabitants to move into the fringes of Haines Junction.

The Haines Junction Businessmen's Association identified a variety of benefits they expect will accompany and follow pipeline construction: community stability, a high school which would allow students to remain in the community rather than moving to Whitehorse, more services, more houses, new business opportunities, water and sewer systems, social and recreational facilities, a cottage hospital and postal facilities.[40] They also predicted that if Foothills provides gas to communities along the pipeline route, this will increase the potential of Haines Junction for industrial growth. They concluded with a statement of faith: "we feel confident that the Government of Canada and the Yukon Territory will ensure the damage to the environment will be minimal"[41] and "that the pipeline people will co-operate to the fullest extent" (with government). Yet their underlying ambivalence to such government control is mentioned by one speaker who follows his statement of confidence with a comment that "the absolute lack of communication between Federal and Territorial governments is historic both at the top and through many lower levels."[42] What they seem to suggest is that socially there will only be benefits to the business community and environmental concerns are of so little importance that they can be relegated to government.

They are equally optimistic about the potential for community growth after the pipeline is in place. Haines Junction is one of the five highway communities scheduled to gain 22 permanent jobs for operation and maintenance of the line after it is completed. While some communities discussed this as an opportunity for their present residents to get better jobs, Haines Junction business people are hopeful that 22 new families will move to their community.[43]

Businessmen in Watson Lake are no less supportive of a pipeline but they are much more cautious. Where Haines Junction businessmen seem willing to rest on good faith, Watson Lake businessmen would like assurances and guarantees that Foothills will provide gas to their community, that distribution of that gas will be

controlled by the community, and that funds will be made available for any extra facilities needed as a result of the pipeline, such as medical facilities, schools, fire and ambulance services, recreation, and library facilities.[44] Another man pointed out that existing small businesses should not have to provide the taxes to cover all the expenses related to pipeline impact, especially welfare, schools, accidents and police, and furthermore that Foothills Pipelines should help improve recreational facilities in the community.[45] Where Haines Junction businessmen listed social benefits, Watson Lake Businessmen isolated social impacts and asked: "Who will pay?"

Underlying both positions, though, and visible in the white sector of every Yukon community is the assumption that a pipeline means community growth and that somehow, somewhere, someone (government and/or industry) will protect the community and prevent negative impacts.

The sixth group are the unambivalent 'boomers'. They have been waiting for an opportunity to live out what they perceive as the classic Yukon mythology created in 1898. Many of these people have been in the Yukon for many years, waiting for another boom; – others have come more recently, hoping to find a last, lucrative frontier. They have hopes of participating in a bonanza which will bring them money or adventure or both.

They equate a pipeline with progress and either dismiss social and environmental concerns as "garbage"[46] and opponents of the pipeline as "layabouts on welfare"[47] or suggest that technology can overcome any environmental problems and the government can prevent negative social impacts. Ironically this group would assuredly oppose most attempts of government to try to control impacts. Some even suggest that a pipeline will improve race relations in the Yukon;[48] others point to wildlife on cutlines as an indication that a pipeline will increase game.[49]

Outspoken advocates of this view are frequently independent businessmen, lodge owners, construction workers, contractors or trailer court owners. They support the idea that pipelines, hydro dams, roads and railways will improve the Yukon and their talks are peppered with reference to progress, stimulation and growth. Many of them object to the time wasted in Inquiries and harken back to the good old days when construction projects began without preliminaries. One man, for example, informed the Inquiry that "Progress is what the world is all about. We can't stop progress and we never will". He refers to the $10 billion project as "just a dinky little pipeline" and asks "why all the fuss?"[50] Another urges, " . . . let's just do it – get it through here, but don't look at it as a long range thing. It's not."[51]

This group accepts without question that the metropolis can't be wrong and assure the Inquiry that "whatever is going to be done will be done to the benefit of the people of the Yukon".[52] They subscribe to a social darwinist view that if 'we' don't hurry 'they' (the then competing El Paso project in the U.S.) will get the pipeline.[53] Occasionally one of this group waxes eloquent in boreal prose like the politician who urged the Inquiry, "Let us venture into the forest of challenge that lies ahead rather than remain in the security of the trees on the fringe"[54] welcoming discussions of a hydro development to accompany the pipeline.

This viewpoint appears again and again in all the small communities along the pipeline route as well as in Whitehorse. Its proponents are often the strongest opponents of Indian land claims settlement and repeatedly use the Inquiry as a

forum to express their dissatisfaction with Indians' claims that they have special rights.

In addition to the very deep cultural gulf which divides this group from Indian groups is the fundamental belief of these individuals that the government will protect them and the equally fundamental belief of Indians that the government will *not* protect their interests and rights. In this regard, the weight of past history seems to be on the side of the Indians.

Conclusion

Inquiries have become the new myth-makers in Canada's north. Seemingly, they have two different functions: one in the arguments they make to the rest of Canada in their reports, another in the mythologies they clarify in the north.

The Lysyk report conveys to Canadians an impression that except for a few malcontents, 'Yukoners' are generally united in the belief that they can cope with a pipeline, provided there are certain government controls. The Yukon is a frontier which Canada can industrialize in good conscience because it has been a frontier for so long.

On the other hand, there are at least six obvious Yukon mythologies reflected in the transcripts of the Alaska Highway Pipeline Inquiry hearings and they seem to be expressed in roughly equal proportions. First, there are the oldest Indian people whose testimony is a direct reflection of the traditional Athapaskan mythology which still guides their view of the world. Their testimony is a comment on life rather than on pipelines and reflects a need for man to respect and work with, rather than against, the land. Secondly, middleaged Indian men and women talk of a better life before the highway and their vision of a better future after land claims are settled. They explain why government regulation of so massive a project may ultimately harm those it sets out to protect. Thirdly, younger Indians are achieving a spiritual and political renewal through their work on a land claims settlement. They speak of land claims as a symbol of a better future and a pipeline as symbolic of the forces which threaten that future.

Fourth are whites whose mythology revolves around access to wilderness, some degree of self sufficiency, and alternative ways of living which they consider to be incompatible with large scale industrialization in the Yukon. For them, the real issue is not the pipeline; the real issue is the need for a long term development strategy which will not continue to colonize and exploit the north. Fifth are the business people whose mythology involves re-recreation of southern style communities in the north. They see the pipeline as a cornucopia which can easily be controlled to benefit all Yukon communities. Finally, the enthusiastic pro-pipeliners are the new 'goldrushers' who would like to participate in a modern Klondike mythology. They wish the pipeline could be built tomorrow with no fuss about regulations.

At present there is no clear development plan for the Yukon. As an indication of the piecemeal approach the federal government takes to northern development, the Alaska Highway Pipeline Inquiry was only one of several inquiries independently touring Yukon communities in the summer of 1977. Public hearings were held soliciting opinions about the paving of the north Alaska Highway, plans for Kluane National Park and environmental implications of pipeline construction. Meetings were being held between Territorial government and Kaiser Aluminum about the possibility of constructing a smelter in the Yukon. More talk was current

about the possibility of a major hydro-electric dam in the Yukon and an oil pipeline down the Alaska Highway. The National Energy Board, after hearing no evidence on the subject, ruled on July 4, 1977 that a lateral pipeline down the Dempster Highway should be built to join the Alaska Highway gas pipeline.

In retrospect, discussions of the Alaska Highway Pipeline have followed the classic example of government and industry getting together to decide the future of a region, albeit with a lively show of public participation.[55] Dean Lysyk himself has now become the scapegoat created by the federal government to convince people in the Yukon that their views have been heard. He repeatedly refuted criticisms of the shortness of his Inquiry by explaining that this was the first stage of a two stage Inquiry: since then it has never been clear when or whether or how a second stage will take place or what its terms of reference might be. He repeatedly told people in community hearings that it was important for them to state their opinions to the Inquiry: the report did not reflect those opinions. As usual, the real actors in the frontier or homeland mythology are not the people who live in the north but the political and economic decisions made in Ottawa, Calgary, Washington and New York, by those who perceive southern needs for northern resources.

If the Lysyk report has provided the mythology for continued colonization, the recent *Pipeline Act* has provided the formula. It ignores all of Lysyk's major recommendations, makes no reference to the settlement of Indian land claims, assumes – without a shred of socio-economic or environmental data – that a Dempster Lateral pipeline will be built to join the Alaska Highway pipeline, locates administrative headquarters for the pipeline in Calgary and Ottawa, and precludes any possibilities of Appeal should Yukoners want to challenge any decisions made by the federal government and Foothills Pipe Lines Ltd. Skeptics in the Yukon expect the next stage to be a government offer to finance the pipeline.

Colonial myths cannot be maintained forever but the Lysky Report will ultimately stand as a significant contribution to the mythology of colonialization in the north. What is needed to balance this is a clearer exploration of local, northern mythologies by the people who live there and will continue to live there. The components of northern mythologies are developing unevenly but their synthesis is creating newer mythologies which encompass and surpass both 'frontier' and 'homeland'.

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Aboriginal Politics in the Yukon Territory

John J. Steeves

The economic base of Yukon Indian people is largely unknown. It can be presumed that many people still live off the land and maintain a relationship to the land that provides a protein source and sustains cultural and spiritual values. Most of these activities are not visible to many non-Indian observers, some of whom are members of the Yukon Legislative Assembly, who draw conclusions from the superficial features of Indian life.

Many Indian people in the Yukon do not choose to work at an open pit mine or an asbestos packing plant. The simple fact is that the cleavage between those who participate in the pattern of industrial development described, and those who do not, is very much (although not exclusively) a racial one, between Indian and non-Indian. Even granting the qualifications of Hobart, Usher and Watkins in the Berger Report,[1] an argument can be made for a dual society in the Yukon. It is not so much the dichotomy between aboriginal/traditional versus metropolis/industrial although many people still live off the land; more accurately, it is a duality between those who have the skills and training to enter a high technology life style and hence the pre-disposition to do so, and those who do not. Put another way, it is the difference between Whitehorse Indian Village and Riverdale, the difference between those who are outside and excluded from the industrial economy and those who manage its affairs and benefit from its well-being.

It is in this context that land claims must be considered. The Council for Yukon Indians (CYI), along with every other Indian organization in Canada, has always maintained that land claims are much more than a settlement over cash, land and mining royalties. They are an opportunity to discuss the re-ordering of political relationships in the Yukon, and therefore, the issue of provincial status is suddenly re-defined in ways fundamentally different from those of the Territorial and Federal Governments.

History of Land Claim Politics

Unlike the cultural and territorial unit which exists for other native Indian groups Yukon Indians possess no territorial delineation that would characterize their population as homogenous. There are suggestions by Diamond Jenness and others that the southern portion of the Territory's population was wiped out at the time of contact with white civilization either by disease or internal conflict. It is postulated that newcomers from the west coast, Alaska and northern British Columbia replaced the indigenous population. At the very least

> ...it seems almost certain from present evidence that the Yukon Indians either have experienced major acculturation stresses from contacts with other Indian groups or are scattered remants of displaced Indian groups who originated elsewhere. (Consequently) Yukon Indians are a heterogenous, highly individualistic population....They have few common denominators among themselves other than a common relationship with the White man.[2]

The one important anomaly in this generalization is the community of Old Crow, of Kutchin origin (sometimes called Loucheux), whose population in 1974 was 153 people. Present archaeological studies indicate the existence of a highly developed subsistence culture there as far back as 20,000 years ago. These people are included in the Yukon solely by the arbitrariness of non-Indian political boundaries. Historically they have more in common with their brothers and sisters in Alaska and the Mackenzie Delta than with the Tlingit, Tahltan and Chilkoot communities in the south. The latter communities include Burwash, Carcross, Carmacks, Dawson City, Haines Junction, Mayo, Pelly Crossing, Ross River, Teslin, Upper Laird and Whitehorse. There are approximately 4,300 people considered of Indian ancestry in Yukon, of which 2,800 are status and 1,500 non-status.

Indian society in the Yukon is organized around two matrilineal clans, the Wolf and the Raven clans; a person's identity is intimately tied to his or her Wolf or Raven lineage. Marriage is usually the joining of the two clans while potlatches are invariably given by one clan for the other. The nuclear family makes up a sub-unit of the clan and is headed by its elder male. The elder female holds the traditions of the family and clan and a person's lineage is traced through his or her mother. This latter characteristic brings into sharp focus the contradictions of the Indian Act which arbitrarily defines Indians through their father. Despite this type of legislation and other acculturation attempts, the Wolf and Raven clans remain today.

At contact the traditional familial patterns were well developed and provided the indigenous base for a subsistence economic system. But within that generation (about the turn of the century) social changes began to reflect the inevitable intrusion of a cash economy. Work as a packer or guide provided wages to purchase the commodities of a highly advanced technology. These were such things as processed and packaged food as well as adequate clothing which only required a cash exchange to acquire. Labor no longer directly produced the means of a comfortable living; an intermediary in the form of cash was becoming more important than labor itself. As Indian people were to realize with the coming of welfare and other transfer payments, productive labor could be done away with entirely.

Hand in hand with the incipient capitalism of the Hudson Bay traders was the legitimizing evangelism of the church. Having won over many Indian people early in the century, they persuaded them to enroll their children in the notorious residential schools. George Manuel, former President of the National Indian Brotherhood, remembers his brief "education":

> Three things stand out in my mind from my years at school: hunger, speaking English, and being called a heathen because of my grandfather (a well known medicine man). On the day we arrived at the school, each new boy was assigned an interpreter, who was a senior student. All the teachers

> were monks, or devout lay Catholics. We called them brothers. In my first meeting with the brother, he showed me a long black, leather strap and told me, through my interpreter, 'If you are ever caught speaking Indian this is what you will get across your hands.' (Half of each day was spent doing) industrial training... We would pack fifty pounds of green cord wood by foot from where it was tied up in a boom by the river up to the buildings, a distance of a mile and a half. Brothers or helpers were stationed along the trail. If we stopped they had whips to get us moving again.[3]

With the completion of the Alaska Highway during World War II and the consequent emplacement of a wage economy along the highway route, the economic and social lives of Indian people began to rapidly change. Within two generations family ties were either broken or under great stress and working for cash became the most significant economic activity. But the advancement of a successful wage earner who was also an Indian was circumscribed by a bias which denied social acceptability and legal equality. Admittance to bars (even with non-Indian friends) was legally prohibited to "unenfranchised" Indians and yet to become enfranchised only allowed them to legally drink while denying their Indian status and doing nothing to overcome race barriers.

Indian Participation in Yukon Society

Considering the outcome of the above economic and social confrontation it should not be particularly surprising to discover a general lack of Indian participation on societal institutions of the Yukon. Indeed, the general irrelevance of white institutions had created the need for separate Indian institutions to define education policies and resolve internal and external political conflicts.

In 1976 the Yukon Native Brotherhood (YNB) announced the beginning of a study, "Action Research", in the Territorial school curriculum. A statistical profile was released that indicated Indian students (from kindergarten to grade 12) made up only 664 of a total of 4,903 students in the Territory.[4] Only six Indian Grade twelve students graduated in 1976 and five were expected to enroll in post-secondary courses. There were, in 1976, eighteen Indian students in Grade eleven, six in Grade ten and fifty in Grade nine.[5] Of the fourteen then taking post-secondary education, six were in Arts courses, six in vocational training (emphasis on social work), one was studying law and another was to be a teacher.[6]

Earlier in 1976 the Yukon Association of Non-Status Indians (YANSI) released its own three year study of education opportunities available to Indian people, entitled "Barriers to Education".[6] The study is particularly critical of the Department of Education's refusal to apply for additional funding to pay for special programs such as the remedial tutoring program:

> It is indeed surprising to find the Department hesitant about applying for additional funds for urgently needed programs, especially when the Department suggests that these types of programs cannot be implemented because of lack of funds.

The Territorial Department of Education further holds that no racial group in the Yukon shall receive special consideration beyond that available to other groups.

> The Department should recognize that Native children are currently handicapped within the present system and are educationally disadvan-

> taged... Native children...deserve special staffing and programing not because they are a special race, but rather because they face particular problems and have particular needs of their own.

The YANSI study traces these policy decisions to the political level by pointing out that senior officials in the Department have publicly supported special programs for Indian children while politicians have overruled them. "This 'same' education reinforces the educational differences that presently exist in our society and in so doing, perpetuates the present social and economic inequalities."

Compared with the total Yukon population, the educational attainment of non-status Indians is significantly lower. Approximately 31 per cent more non-status Indians have an education lower than Grade 9; 25 per cent more have an education lower than Grade 12; 14 per cent as many have received post-secondary education; and 21 per cent as many have attended university.

The typical situation is not one of "dropping out" but "it is a steady, gradual process more akin to being pushed out."

There is the further matter of how relevant the Territorial Government structure is to Yukon Indian people as indicated by their participation in its elected Assembly. Prior to the 1974 election, the Electoral District Boundaries Commission received a brief[7] suggesting boundaries that would facilitate the election of one Indian person to the Assembly; however for an Indian person to be elected to the Territorial Assembly, he or she must attract non-Indian votes in order to secure a majority or even a plurality. With the Indian vote spread thinly among the polls the potential electoral strength of Indian people is fragmented and ineffective. By contrast, the non-Indian candidate can, with varying degrees of ease, achieve electoral success by concentrating on non-Indian issues. The result is that election issues are typically non-Indian issues compounding the problem of participation and completing the circle that effectively excludes one-third of the Territory's population.

This exclusion is expressed by the potential Indian/non-Indian cleavage within the Territorial Assembly. This cleavage is non-existent, it can be simply stated, since the Assembly from its beginnings as a representative council in 1900, has not had a single Indian member. What's more, the above described electoral system has not attracted Indian candidates in any of the twenty-six elections since 1900 except for the last one in 1974.[8] The only acceptable conclusion is one that describes the Territorial Assembly as representative of only non-Indian interests.

Aboriginal Rights

It is the indefatigable support of aboriginal rights which has given Indian people their legal credibility and political impetus. Aboriginal rights are the basis for land claim negotiations in non-treatied areas of Canada, and when articulated in treaty areas provide a basis for an expression of betrayal.[9] No other issue embraces traditional and contemporary Indian values to the extent of creating an axis around which Indian/non-Indian cultural relations revolve.

There are comparatively informal aspects to the concept such as the importance of verbal versus non-verbal communications. Traditionally, Indian people could expect to periodically attend meetings of the whole community to consider problems of general importance. As the written tradition was not at all developed, that which was spoken had the potential of being recorded in the

verbal tradition of the community. As a consequence of this tradition Indian leaders entered into what were for them binding verbal agreements as to treaty negotiations or protection of hunting areas. The non-Indian tradition, however, declared that the written word had paramount authority. Even if the non-Indian negotiators had wanted to be sincere, which was rare enough, the courts would enforce merely what was written, and that in English or French.

Like the dichotomy which arises from the legal precedence of a verbal or non-verbal tradition, there is a conflict over the concept of ownership of land as defined by Indians and non-Indians. The Euro-Canadian concept of ownership, grounded as it is in the British property system, emphasizes possession, transferability, and registration and is geared for individual "ownership". Land is treated as a commodity in exchange for which an individual can receive value in the form of money and status. In order to systemize this approach, land is surveyed, registered and defined to more precisely define the value and facilitate the transfer or exchange of land. Such a system permits the cataloguing of ownership so that it is possible to see who has owned a given piece of land all the way back to the original owner; the Crown is the source of all title.

In contrast, Indian ownership is community based. The source of title is not the Crown; all humans have an interest in the land, an interest common to all living things. This includes plants, sometimes rocks, and all the animals. Further:

> Ownership does not rest in any one individual, but belongs to the tribe as a whole, as an entity. The land belongs not only to the people presently living, but it belongs to past generations and to future generations. Past and future generations are as much a part of the tribal entity as the living generation.[10]

The convergence of these two philosophies, as history documents, has resulted in the dominance of the British property system. In practical terms this has created the need for legal processes to reach an accord with Indian people that neatly defines ownership in terms of British law – this is one way of defining land claims negotiations. Despite its dominance in the conflict, Canadian-British traditions have also felt the need to define, rationally, the origins of ownership, how can one gain ownership and sovereignty over a particular piece of land?

One can have this situation by virtue of aboriginal rights which means that a people, whether Saxon or Kutchin, were the original occupiers of the land. Ownership can also be gained by means of conquest, usually settled in a peace treaty. Finally, one can gain ownership through conveyance (a contract between parties, usually with some exchange or consideration) and by virtue of first discovery. Those Indian lands in Canada covered by treaties fall, for the most part, in the category of ownership through conveyance where Indian people are given consideration (usually land and some commodities per annum) in exchange for the aboriginal rights to their lands, their aboriginal rights are extinguished by the treaty.

However, in those areas where treaties are not in force (the Maritimes, British Columbia, the Yukon and Northwest Territories), the rationalization for ownership is, at best, questionable because none of the above means of transferring title has been used – strictly speaking it is still Indian land. This is the issue upon which the Supreme Court of Canada in the Nishga case was split. Indian people hold the aboriginal rights to their land; they were not conquered in most cases; they did not settle through conveyance; and the notion of first discovery is in favor of the Indian people through prior occupancy.

Moreover, there is no satisfactory means of recognizing aboriginal rights within the Canadian property system. As described earlier these rights are extinguished by treaties so that the status of Indian people as land owners is the same as any other group in society. This legal status is defined by the concept of fee simple: land tenure which retains, for the Crown, such rights as sovereignty and taxation.

This restriction inherent in fee simple ownership of land, while compatible with some non-Indian values, demands of Indian people that they accept the extinguishment, not only of their title, but, as well, the alienation of the basis of their culture: the land. As suggested the land is inalienable or as Dene people in the Northwest Territories comment, "Our people have a saying that the real owners of the land are not yet born."

The foregoing is important for it raises the central issue of Indian land claims in the Yukon and elsewhere. Indian people are being asked to accept enormous cash settlements (one billion dollars in Alaska) in exchange for their land. Cleavages arise within Indian communities as to the long run benefit of such a settlement. Many leaders suggest that after the extinguishment their people are turned loose in a cultural wasteland where land loses its cultural values and becomes a commodity.

Land Claims

The government, for its part, is understandably uncomfortable with the term "aboriginal rights". To recognize such a concept literally calls into question the legal foundation on which property is based in those areas not covered by a treaty. Such a massive flaw is clearly unadmittable. The government prefers to discuss Indian "title" or "claim" which acknowledges the loss of land over the years and allows for negotiations to decide on the amount of compensation. As vague as this rationale is, the end of the negotiations is seen clearly by the government as the extinguishment of Indian claims. This seeming paradox is a way of not accepting aboriginal rights but providing for a process to extinguish those same rights.

It was the Alaskan land claim settlement of 1971 which sparked a good deal of similar discussion among Indian people in the Yukon.[11] Alaskan Indian, Inuit and Aleut people found that by 1970 the American government and business sectors were extremely anxious to facilitate the exploitation of the state's natural resources, especially oil and gas, in order to serve the, at times, urgent needs of the "lower 49". In order for the land to be organized and alienated by the government for the corporate interests, ownership had to be acquired from Alaskan native people.[12] Unless the claim of the Native people was resolved, "each state land selection, mineral lease offer, homestead entry, mining claim, application for a right of way, for a use permit, and for purchase or lease of land and other property may be challenged."[13] Pressure became intense in 1970 when the proposed Alaskan pipeline (from the Arctic coast across the state to the Pacific coast) became a *fait accompli* that awaited only the land claims settlement.

With the settlement, the Alaskan native people received, as a group, a one billion dollar cash settlement (divided between an outright payment and royalties from future developments) and the ownership of 40 million acres of land. The means of administering the cash settlement and managing the land settlement

was given over to an elaborate corporate structure as defined in the Settlement Act. The state was divided into twelve areas, each with a native corporation receiving a share of the cash settlement. As well, a Native Investment Corporation was set up and a thirteenth native corporation to allow native Alaskans living in the "lower 49" to participate. Membership in the corporations (including the Boards of Directors) was limited to Indian people for twenty years after which anyone could purchase shares. Eligibility was extended to anyone with one-quarter Indian ancestry so that the precedent was set to allow those other than full blood Indian to participate. Finally, the concept of aboriginal rights was recongized but only as a matter of form in order to permit their extinguishment.

To date there appears very little to commend the Alaska approach to land claim settlements. The 40 million acres agreed upon as part of the settlement remains locked in legal arguments over the relative recreational-economical value of certain areas. Many groups are still awaiting decisions as to what land they are to receive.

In 1976 the U.S. Department of the Interior filed an action on behalf of Inuit groups (actually, the Department was ordered to file the action by a District Court Judge) against 126 corporations – possibly involving 2,500 separate actions – to obtain damages for trespassing on Inuit land before the Settlement Act of 1971. There is a strong pressure to amend the Settlement Act in order to forgive the corporations their trespassing but many of them have profited greatly by trespassing. Prior to 1968, 1.3 billion dollars worth of mineral resources had been extracted from Alaska – without any payment to native people.[14]

Finally, there are the consequences of the Alyeska Pipeline which must be considered as part of the land claims package. Evidence before the American House of Representatives indicates over 4,000 faulty welds along the 800 mile route. All of these were falsified or covered up by Alyeska and many are in environmentally sensitive areas which are generally the most difficult to work in. During water pressure tests, sections of the pipe have split apart at 187 pounds per square inch pressure and yet actual operating pressure will be 1,180 psi. Digging up and repairing the faulty welds will cost $55 million, an amount which will add considerably to cost over-runs of over $6 billion dollars, original estimated cost was $900 million and present costs exceed $7.7 billion. Apart from these examples of improper control, outright deception and general mismanagement, there is now no market for the oil when it comes on stream at Valdez on the Pacific. The original intention was to use tanker ships and transport the oil to California for refining and transporting to the energy-starved American Midwest. But during the construction of the Alyeska line the laws in California have been changed, first of all, to prohibit large tankers in the intended ports and second, to prohibit the refining of high sulphur crude (such as Alaska's) because it is too polluting.

Nor can anything commendable be said for the economic advantages of such a massive project. With an invading work force of 18,000 (the state's population increased by 66,000 from 1973 to 1976 for a total of 396,200) the state, and in particular the city of Fairbanks, experienced rampant inflation and only a marginally improved unemployment rate.[15] Native people are faced with tremendous social breakdown, reductions in caribou and salmon harvests (their traditional food supplies) and the further prospects of strip mining for coal on the Arctic slopes. The native corporations have invested well over 50 per cent of their

investments to date in short-term construction and service industries directly tied to the pipeline. The result is infrastructure intimately linked to large scale development, financed by the people whose traditional lifestyle will inevitably become eradicated. An Alaskan government economic analyst wryly comments, "There is no doubt that native corporations are now, and will be even more so in the near future, a dynamic participant in the economy and business development of the state."[16]

"Together Today for Our Children Tomorrow"

In the Yukon as early as 1902, Jim Boss, hereditary chief of the Southern Yukon Indians, had petitioned the Superintendant-General of Indian Affairs in Ottawa for "compensation because of the taking of possession of lands and hunting grounds by the white people."[17] Chief Boss estimated that prior to the Goldrush the Indian population in the Territory numbered several thousand but by 1902 had fallen to less than a thousand because of disease and starvation. "Tell the King very hard we want something for our Indians because they take our land and game." The indifferent response of the Superintendant was to write across Chief Boss's letter that the North West Mounted Police would be authorized to issue "necessary assistance for the relief of destitute Indians... and certain medical assistance where required."[18]

Activity towards preparing a land claim began in earnest in the Yukon during the early 1970's. Earlier, in October 1968, the Yukon Native Brotherhood (YNB) was formed at Skookum Jim Hall as a means of organizing the opposition of Yukon Indians to proposed changes in the Indian Act. The Brotherhood was formally incorporated in February 1970 and directed itself towards preparing a land claim position, similar to the one their Alaskan brothers and sisters were negotiating at the time. By February 1973 the twelve Yukon Indian communities in the YNB, with research funded by the Federal Government, gave expression to a show of solidarity with their epic document, "Together Today for Our Children Tomorrow," a statement of grievances and suggestions for a settlement.[19] The Prime Minister accepted the document and agreed to commence negotiations which have continued to date.

The distinctive feature of Yukon land claims is the participation of non-status Indians. "Together Today for Our Children Tomorrow" was the first successful attempt to gain recognition for the non-status population (those one-quarter Indian blood or over) and its participation in the settlement in Canada. A month after the release of the YNB's position, the Yukon Association of Non-Status Indians (YANSI) presented its comments to the public. It accepted the 25 per cent eligibility principle (as in Alaska) but went on to criticize the exclusion of non-status people from the negotiating team and various implementary bodies. As a result, later in 1973, the YNB and YANSI met together and agreed to establish the Council of Yukon Indians (CYI) in order to present a common front in negotiations. Unlike the Northwest Territories where a serious split exists between the Indian Brotherhood and Metis Association, the two groups remain partners in their land claim endeavour. This is confirmed by recent proposals to amalgamate YNB and YANSI in order to facilitate the administration of programs.

The CYI has come to represent half of a dual legislative system functioning in the Yukon. The relevance to Indian people of the Territorial Legislative Assembly is limited to the rhetoric of its non-Indian members who claim to represent all

Yukoners. In fact, the CYI functions as the legislative body for Indian people. It has an identifiable and supportive constituency system and manages the creation of programs and allocation of funds. Its functions extend to representing the Indian and non-status point of view to Federal Government and press. Within its structure issues such as education and cultural programming, court workers and economic development are discussed, prioritized, implemented and administered. In short, the CYI fulfills the structural need of an organized and expanding, but discriminated-against section of the population.

"Together Today for Our Children Tomorrow," although modified by subsequent political exigencies, remains the seminal statement for Yukon land claims. The land selected by Yukon Indians would be held in perpetuity by the Crown for the use of present and future generations. Sub-surface rights would be included in the land ownership. The cash settlement would be paid over a ten year period and would be in addition to various mineral, fishing and logging royalties. A municipality could be established to administer the land with the cash settlement, one which is wholly independent of the Territorial Government. But it is the astute ambiguity of the statement which permits a broad interpretation and conveys a general picture of the Yukon from the long neglected viewpoint of its Indian population.

By the spring of 1976, after nearly three years of negotiations, it appeared that an Agreement in Principle was imminent. In May the Toronto *Globe and Mail* released a "Draft Agreement."[20] With this agreement, Yukon native people would have received as Category I land, fee simple ownership of 1,200 square miles, including sub-surface mineral rights. Category II land consisted of 17,200 square miles sub-divided into exclusive hunting, fishing and trapping areas and forest management areas. The cash settlement would have been over $90 million divided into $35 million cash and as much as $55 million revenue sharing over 30 years. Category I lands would have come under complete control of Indian people and they would have substantial say over Category II land.[21]

But the negotiating parties were a good deal further apart than the *Globe and Mail* story indicated. The CYI was still holding out for 44,000 square miles, fee simple, with sub-surface rights in Category I and 70,000 in Category II. They were also arguing for a $670 million cash settlement supplemented by 50 per cent revenue sharing on Category I land and 25 per cent on Category II land. The extension of Indian Affairs programs to all claimants (including non-status) was thought reasonable, as was exclusive trapping throughout the Territory. The Territorial Government, although allegedly fulfilling a minor "observer" role, proved to be the most severe brake on negotiations. They simply refused to consider land and cash as elements of the settlement and remained intransigent in defending their interests.

In fact, the National Indian Brotherhood (NIB) were not so concerned with an end to negotiations as they were to the style of negotiations being practised and thus, the type of precedent that would be established for other negotiations in British Columbia and the Northwest Territories.[22] Concurrent with the release of the draft agreement, the Band Chiefs, with the support of the National Indian Brotherhood, began to put pressure on the Council of Yukon Indians' executive. They were concerned about not signing an agreement until everyone in the communities was educated about the importance of land claims and, in particular, until everyone understood about aboriginal rights. A subsequent

survey by the *Yukon Indian News* indicated a tremendous lack of understanding within the communities about land claims. As a result, the CYI General Assembly meeting in May suspended the negotiations and effectively removed the negotiators pending major structural changes within the CYI and the creation of strong community links to the negotiating process.

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[1] *Report of the Mackenzie Valley Pipeline Inquiry*, Chapter 9.

[2] A. R. King, *The School at Mopass: A Problem of Identity* (New York: Holt, Rinehard, 1967), pp. 5-6.

[3] George Manuel and Michael Posluns, *The Fourth World* (Toronto: Collier-Macmillan, 1974), pp. 63-64.

[4] *Yukon Statistical Review*, fn. 7.

[5] *Yukon News*, July 7, 1976.

[6] Yukon Association of Non-Status Indians, *Barriers to Education*, February 1976. See Also *Yukon News*, February 18, 1976 for abridged version.

[7] Taken from a private study done for the Council for Yukon Indians in November 1976 by Kutchin Consultants, Whitehorse.

[8] Ray Jackson, past president of the Yukon Native Brotherhood, ran in Kluane placing fourth in a field of six; Charles Abel, band chief of Old Crow, ran in Ogilvie placing second in a field of three. See Information Canada, *Report of the Chief Electoral Officer*, Yukon Territorial Election, 1974.

[9] For a well documented study of misrepresentation and deception in Treaties 8 and 11 see R. Fumoleau, *As Long as This Land Shall Last* (Toronto: McClelland & Stewart, 1975).

[10] Leroy Little Bear submission to Mackenzie Valley Pipeline Inquiry, April 1976. Abridged version in *Whitehorse Star*, June 9, 1976.

[11] The principal means of communicating such information is through family ties which have very little to do with international boundaries.

[12] The *Alaska Organic Act* of 1884 had given native Alaskans a good deal more recognition than had been the case in the treatment of other native Americans. The Act stipulated that native Alaskans should not be disturbed in any way until further legislation of Congress had dealt with the claim (Section 8).

[13] U. S., Congress, Senate Report, *Alaska Native Claims Settlement Act of 1971*, 1st. sess., October 21, 1971, p. 73.

[14] *Akwesasne Notes*, Autumn 1976.

[15] Alaska, Department of Commerce and Economic Development, *A Preliminary Review of the Alaska Economy in 1975, A Preview of 1976*, vol. 4, no. 1, p. 2. Alaska has traditionally had the highest unemployment percentage in the U.S. and the lowest rate during the peak of the pipeline construction was 8.9 per cent in 1975.

[16] *Ibid.*, pg. 8.

[17] Letter by F. W. Jackson on behalf of Chief Jim Boss, to Superintendent-General of Indian Affairs, January 13, 1962, Yukon Archives, manuscript collections.

[18] *Ibid.*

[19] Yukon Native Brotherhood, *Together Today for Our Children Tomorrow* (Whitehorse: February 1973).

[20] *Globe and Mail*, May 29, 1976. Also *Whitehorse Star*, June 2, 1976.

[21] *Whitehorse Star*, May 31, 1976; *Globe and Mail*, May 29, 1976; *Yukon Indian News*, May 19 and June 2, 1976.

[22] George Manuel (now retired president of the National Indian Brotherhood) suggested in July 1976 that the National Indian Brotherhood must intervene in regional land claims in order to protect other groups in Canada. See *Whitehorse Star*, July 9, 1976.

Notes on Contributors

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Frank Duerden has done a considerable amount of research in the Yukon Territory. He is the author of *The Evolution and Nature of the Contemporary Settlement Pattern in a Selected Area of the Yukon Territory*. Centre for Settlement Studies, University of Manitoba, 1971. He is presently working on a two-year project related to *The Structure of the Settlement System of the Yukon Territory*. He is a faculty member of the Geography Department, Ryerson Polytechnical Institute.

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Colin B. Crampton, a graduate of Bristol University, England, worked as a research scientist with the Canadian Forestry Service and subsequently with the Department of the Environment undertaking mapping and research in the Mackenzie River Valley for the Environmental Social Program, Northern Pipelines Task Force, DIAND. He is at present Professor in the Geography Department at Simon Fraser University, continuing research in the Arctic and Sub-Arctic.

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Edward Weick has been seconded from the Department of Indian and Northern Affairs to act as the chief socio-economic advisor to the Mackenzie Valley Pipeline Inquiry. He was advisor to Commission Council during the Inquiry hearings in Yellowknife and to Mr. Justice Thomas Berger, Commissioner of the Mackenzie Valley Pipeline Inquiry, during the preparation of his report.

Born in Yorkton, Saskatchewan in 1932, Mr. Weick holds a B. Comm. from the University of British Columbia and an M.A. (Economics) from the University of Ottawa.

Since 1960, he has worked for the federal government, first, with the Department of Transport and, then, the Department of Indian and Northern Affairs in its Northern Programme. As Chief, Economic Staff and Special Advisor on Northern Employment and Economic Opportunities, he supervised and undertook research on transportation, native people, economic development and use of natural resources in both northern Canada and the Scandinavian countries.

In 1974, he was seconded as socio-economic assessment manager to the Pipeline Assessment Group, a task force established by the Government of Canada to provide the initial assessment of Canadian Arctic Gas Pipeline Ltd.'s

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After publication of the Pipeline Assessment Report in November, 1974, he joined Mr. Justic Berger's staff.

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Julie Cruickshank, a graduate in anthropology from U.B.C., has published widely on the Yukon and has been involved in a number of research projects for the Department of Education, Yukon Territorial Government, for the National Museum of Canada and for the Yukon Territorial Archives. At present, she is a Research Associate for the University of Canada North.

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